PUBLISHED FROM 'THE BUILDER' HOUSE, Catherine-street, Aldwych, London, WC2. *Telephones:* Temple Bar 6251-2-3-4. *Annual subscription:* £4; for six months £2. Single copies (including back numbers up to 12 months old) 1s. 6d. (post paid 1s. 10d.). Back issues more than 12 months old 2s. 6d. (post paid 2s. 10d.). *Indices* are produced in July and January each year; copies are sent free on application.

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HOW LARGE ECONOMIES can be made in the cost of construction of multi-storey flats is suggested in the annual report of DSIR. p. 285

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THE BUILDER

Incorporating ARCHITECTURE & THE BRITISH ARCHITECT

Vol. CXCIII August 16 1957 *No. 5968*

THE SITING OF ATOMIC POWER STATIONS

OF all current threats to rural amenity (and scores of them are recorded in the Annual Report, 1956-57, of the Council for the Preservation of Rural England*), the most serious is that inherent in the construction of some 19 nuclear power stations. Only three sites in England have so far been officially announced, namely, Bradwell-on-Sea, Essex, Berkeley, Gloucestershire, and Hinkley Point, Somerset, and on the first two construction has actually begun. So far as England is concerned it seems clear that the intention is to erect the new stations mostly on remote coastal or estuarial sites south of a line drawn between the Severn and the Wash, and it is known that surveys are being carried out in southern and eastern counties.

Lord Mills, the Minister of Power, has admitted that parts of the country which have not hitherto felt the impact of the nation's requirements for electricity will be affected, but has promised that the programme shall be carried through 'with the least possible interference with the amenities of the countryside or with the rights of individuals.'

There are, of course, special siting needs for nuclear power stations, including 'astronomical' quantities of water for cooling; and the economic advantage of sites in areas where there is a deficiency of coal in relation to the demand for electricity is obvious. What is not so clear is the 'need' for remoteness in the interests of safety. Numerous official statements have been made about the 'inherent safety' of nuclear stations, and the preponderance of scientific opinion is that the risks involved are no greater than those arising from many existing chemical and other industrial works in built-up areas. Lord Mills himself in a letter to the CPRE has stated that the possibility of an accident is 'admittedly remote'; while, as to public opinion, the present report points out that the available evidence—as shown, for example, by representations made at public inquiries and by the requests of Welsh and other local authorities for power stations to be sited in their areas—seems clearly to suggest that the degree of public apprehension is being greatly overestimated—is, in fact, surprisingly slight.

We hope that the present policy of taking over haphazardly great areas of unspoiled country may be revoked before it is too late. What enormous areas of land these projects seem to require! The proposed atomic energy research establishment at Winfrith Heath in Dorset, for example, is to spread itself over no less than 688 acres of remote, beautiful and unspoilt countryside.

The CPRE holds, and few are likely to disagree, that this major atomic revolution through which we are going justifies, as a matter of extreme urgency, the preparation of a 'master plan' by the Ministry of Housing and Local Government so as to ensure that there is no haphazard, piecemeal selection of such sites for research stations, nuclear power stations and the like.

Wherever these stations may be sited, whether in the remote countryside or in built-up areas, it is essential that all official undertakings as to siting, design, external appearance of buildings, their landscaping and screening, should be scrupulously observed. Calder Hall is admittedly an experimental station and perfection was not to be expected, but surely such an ugly complex of exposed pipes and steelwork is not inevitable. This question of appearance will need to be closely watched and architectural supervision should be made compulsory.

No one who has any regard for our sadly diminished areas of unspoilt countryside can fail to be seriously perturbed by the present situation, which the CPRE is 'watching . . . with close attention and with no little anxiety,' which would appear to be well justified.

* 4, Hobart-place, London, S.W.1.

Notes of the Week

The Pilgrim Trust

THE gross income of The Pilgrim Trust for 1956 reached the record figure of £165,000, and the total amount of grants voted for the preservation of buildings rose sharply from £69,026 in 1955 to £86,992. This, states the annual report for 1956, was due to increased requests for help for repair of ecclesiastical buildings. Substantial sums were granted to five cathedrals: Lichfield, £15,000; Carlisle, £10,000; Salisbury, £6,375; Worcester, £1,500; and Chelmsford, £2,500. Among other notable structures to which grants for repairs were made are Oxnead Church (The Paston Monuments); Wickhamford Church (Sandys Monument); the Bargany Monument, Ballantrae, Ayrshire; Saxlingham Nethergate Church, Norfolk (stained glass); Guild Chapel, Stratford-on-Avon; The Place of Paisley, Renfrewshire; Pittville Pump Room, Cheltenham; Bluecoat Chambers, Liverpool; Gosford Hall, Essex; Bradbourne House, East Malling, Kent; Farley Hospital, Salisbury; Sir John Jacob's Almshouses, Gamlingay, Cambridgeshire; The Grand Stand and Cuttle, Swarkeston: and several others. The National Buildings Record was granted £600 to buy the Call collection of photographic negatives of medieval subjects.

We have commented before on the all-round excellence of the Pilgrim Trust Reports; they set a standard that might well be noted by some other beneficent organisations that need not be specified. The well-written notes are invariably full of interest alike for layman and antiquarian, and the illustrations well chosen and beautifully reproduced. Those given in the present report include the Sandys Monument; Wickhamford Church, Evesham, a beautiful work of Renaissance character, dating from the early seventeenth century; an excellent engraving of Lichfield Cathedral, by S. Read (*circa* 1880); the Bluecoat Chambers, Liverpool, a fine and familiar example of early eighteenth-century architecture, architect unknown; the Grand Stand, Swarkeston, Derbyshire, a curious little building, probably of Jacobean date, assumed to have been used for watching sports, such as bull baiting; a beautiful engraving, dated 1831, by J. Thomas, after a drawing by Thomas Allom, of the Dolcoath Copper Mine, Camborne, Cornwall; and the exterior of Farley Hospital, near Salisbury, a dignified block of almshouses built in 1681 from the designs of Wren. The report is issued from Millbank House, 2, Great Peter-street, Westminster, SW1.

LTE POSTER.—A new Underground poster, designed by Hans Unger, featuring the work of Christopher Wren, is complementary to a small booklet, price sixpence, which acts as a concise guide for the layman to an appreciation of Wren's architectural work in and near London. Between the characteristic shapes of his spires is a facsimile of the architect's signature 'Chr. Wren.'

CARLISLE CIVIC CENTRE.—Shown above are the winning architects in the competition for a new Civic Group at Carlisle, whose design was illustrated in our last issue. They are Mr. Charles E. Pearson, FRIBA (seated) and Mr. George R. Lovell, ARIBA (Charles B. Pearson and Son)

Saving No. 10

THE St. James's Theatre may be pulled down, the Nash terraces in Regent's Park demolished, industrialists may build in National Parks and speculative builders unadvised by architects may ruin the countryside, but if anything were to happen to No. 10, Downing-street it is doubtful if the Government of this country could go on. It is reassuring, therefore, to learn that this calamity is not likely to happen, for the Prime Minister has now chosen a learned and experienced team of all the building talents to advise him on the reconstruction of Nos. 10, 11 and 12, Downing-street, under the chairmanship of Lord Crawford and Balcarres. They are Lord Chandos; Lord Bridges, who is no doubt already familiar with the layout of the buildings; Sir Howard Robertson, P-PRIBA; and Sir Arthur Whitaker, president of the Institution of Civil Engineers.

Concrete in Mexico

THE April-June number of *Concrete Quarterly* is largely devoted to recent work in Mexico, all of it lively and interesting. A special article on the work of Felix Candela, an architect-engineer who specialises in shell concrete, is accompanied by numerous examples of his buildings, including the Church of La Virgin Milagrosa, remarkable for its triangular shapes, and the Stock Exchange, Mexico City, with its dramatic groined vaulted roof formed of four hyperbolic paraboloid sections. A variety of work by other designers is also shown, including the enormous bowl-shaped Bull Ring and Olympic Stadium at Ciudad de las Deportes, Mexico City.

'City Press' Centenary

CONGRATULATIONS to our contemporary *The City Press* on attaining one hundred years of publication. A special number, introduced with a message from the Lord Mayor, marks the occasion, and has special interest for the constructor in that much of its contents has to do with architecture and building. According to Mr. John Batty, chairman of the City's improvements and town planning committee, new buildings to the value of £25m. had been erected in the City by the end of 1956 and buildings then under construction totalled over £31m. Since then projects totalling another £17m. had been approved.

WOODSIDE SCHOOL, AMERSHAM, for Buckingham C. C.

Designed by the Architects' and Building branch, Ministry of Education, in collaboration with the County Architect, F. B. POOLEY, FRIBA

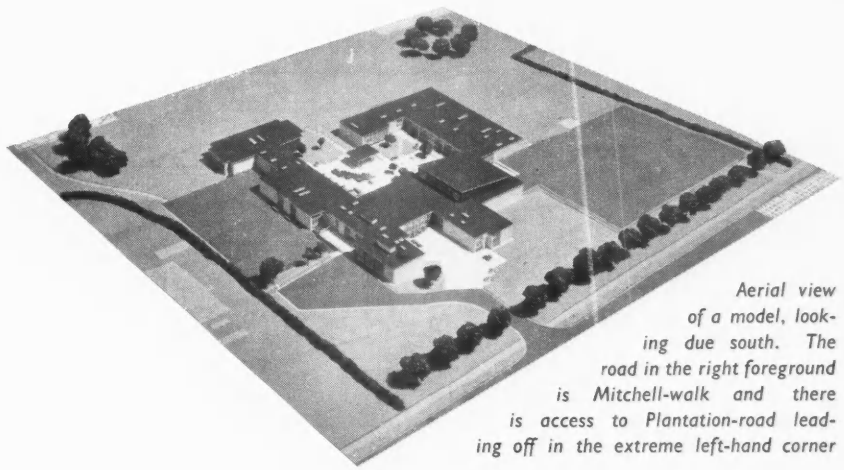
Architects:
J. S. B. COATMAN, ARIBA
Miss MARY CROWLEY, ARIBA
D. L. MEDD, ARIBA
C. E. D. WOOSTER, ARIBA

Quantity Surveyors:
J. NISBET, ARICS
D. F. BOTTLE, ARICS
Miss D. P. HUNT, ARICS

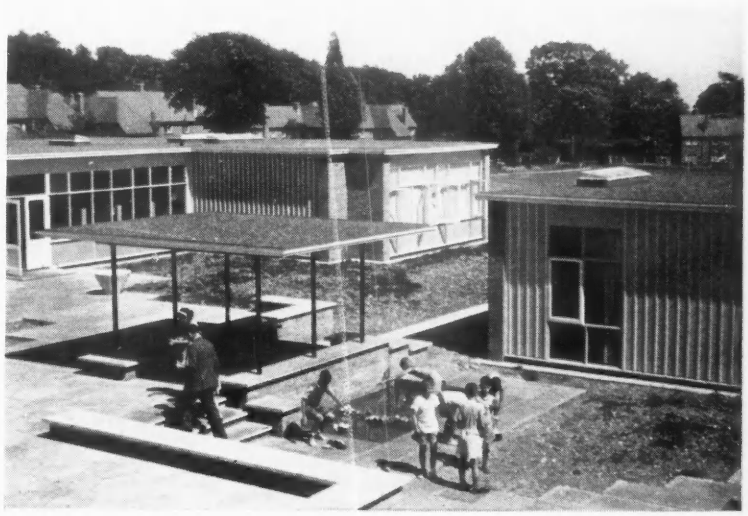
Builders:
WALDEN & Son (Henley), Ltd.

THE SCHOOL is built on a site of approximately 6¼ acres in a housing district on the outskirts of Amersham. The site, which has few features of its own, slopes down towards the south-west. The school has been placed in the northern part of the site, leaving as much free area as possible to the south for playing fields. Two hard-paved areas have been provided near the building. The school is a two-form entry junior school, which means that it is designed to accommodate eight classes of 40 pupils each.

Structure : Building operations started on March 12, 1956, and the children went into the completed building on January 9, 1957. In order to economise in brick-laying, load-bearing walls were restricted to those positions necessary for supporting the roof



Aerial view of a model, looking due south. The road in the right foreground is Mitchell-walk and there is access to Plantation-road leading off in the extreme left-hand corner



A general view of the courtyard seen from the roof. In the centre is the summer-house and a pond. The court will be planted this autumn

construction. Externally they consisted of 11 in. cavity walls with 4½ in. clinker block inner leaf, and internally of 9 in. clinker blocks. Non-load-bearing walls are vertical timber cladding on bearers or studs.

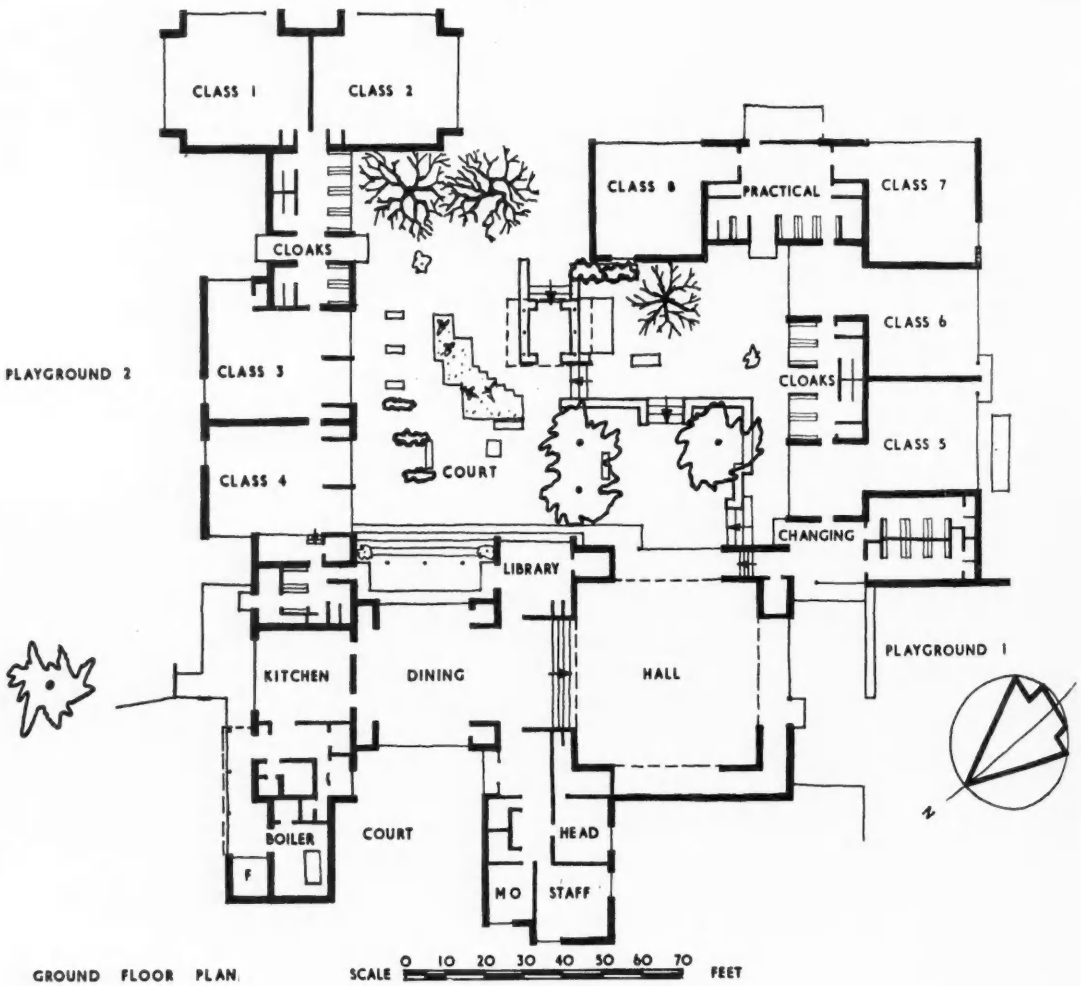
Roof construction : RSJ's were used on spans over 20 ft., elsewhere timber joists. The decking is 8 x 4 x ¾ in. chipboard covered with bituminous felt and granite chips. Insulation is provided by aluminium foil under the decking and mineral wool over the suspended, part-plain, part-perforated, hardboard ceiling. Windows are timber-frame panels from floor to ceiling with provision for blind-housing and wall-bench fixtures. Foundations consist of concrete strips under walls only; partitions are 3 in. clinker blocks.

Heating is by an automatically-controlled installation, consisting of oil-fired boiler, pumped hot water circulation, and forced warm air. Research had suggested that this combination should offer considerable economies in running cost. Electricity service is by PVC cables in the ceiling space with drops in chased conduit. Plumbing and cold water services: mains circulation is in the ceiling space to local storage tanks, drops are chased, plumbing wastes to basins are pre-formed copper units.

Rainwater disposal is by internal down pipes to pitch fibre drains leading to a sump and borehole sunk 70 ft. to chalk level. Drainage is part stoneware and part pitch fibre to mains sewer.

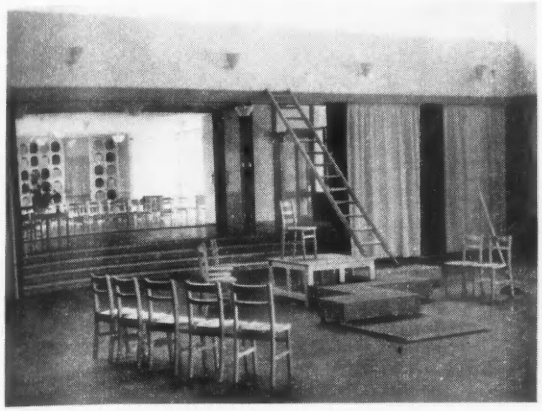
The nett cost of the school on tender was £44,975, a nett cost per place of £140 10s. 11d., which compares in turn with a nett cost for primary schools of £154 per place, and with the national average (December, 1955) of £147.

It is intended to publish a Building Bulletin about this project, which will give full details. The complete cost analysis has already been published in the Ministry's Building Bulletin No. 4 (second edition, 1957).

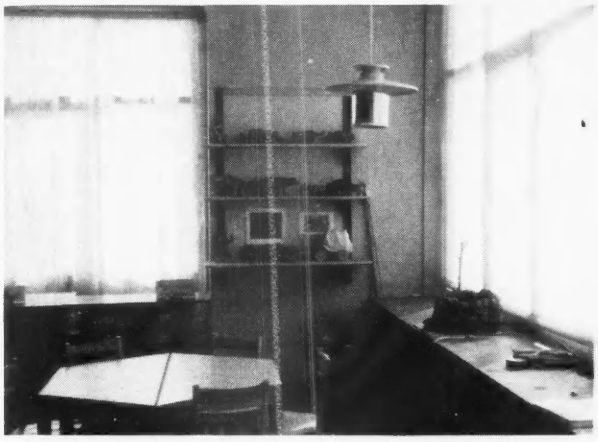


GROUND FLOOR PLAN

School at Amersham, Bucks



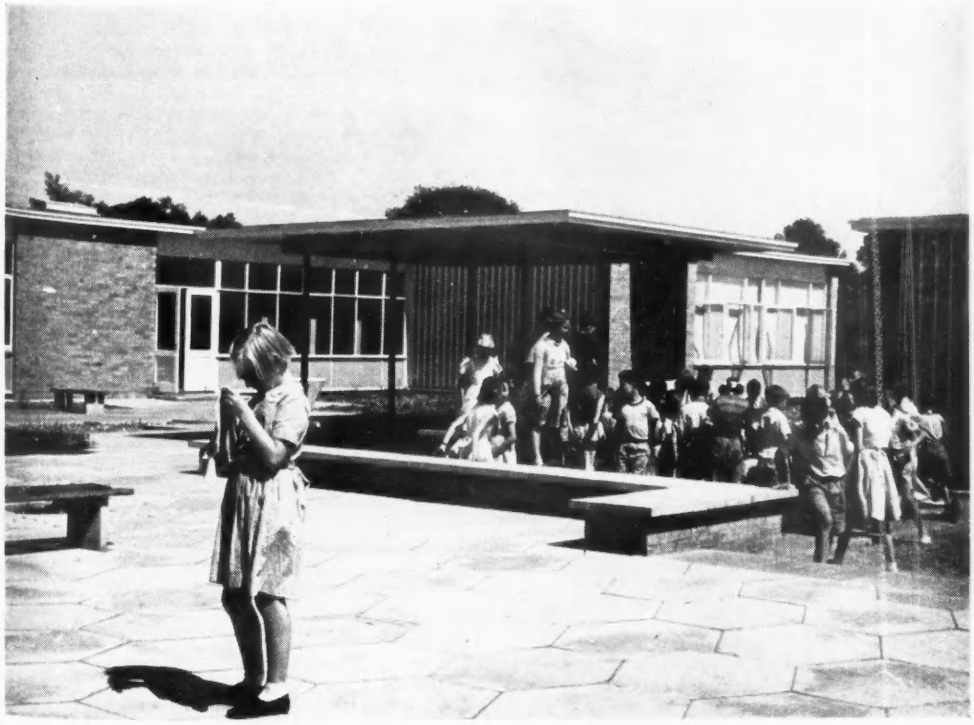
The assembly hall



Two aspects of a typical classroom

Subcontractors & Suppliers:—

Heating, Weatherfoil Heating Systems, Ltd. ; electrical installation, Herbert Lascelles, Ltd. ; roof covering, William Briggs and Sons, Ltd. ; floor finishes, Haskel, Robertson, Ltd., Semtex, Ltd. ; blinds, Deans Blinds (Putney), Ltd. ; sliding folding doors, Esavian, Ltd. ; cold room, Pressed Steel Co., Ltd.



The courtyard being used for outside lessons

Building in Denmark

Developments Seen During Eastern Federation's Visit

By ROBERT W. PORTER, MBE (Director, Eastern Federation of Building Trades Employers)

THE outstanding feature of the Eastern Federation's recent visit to Denmark was the warmth of the welcome we received from the President of Entreprenorforeningen (Mr. N. C. Guldmann) and his colleagues who spared no effort to entertain us and show us something of Danish building enterprise. Following are some of the more interesting developments studied.

Skyscraper flats. Factors of cost and availability of materials have a considerable bearing on current Danish building methods and design and although many brick houses are to be seen, the post-war emphasis, around Copenhagen at least, is on skyscraper flats constructed in concrete.

In the municipality of Rodovre some seven miles out of Copenhagen, we visited an extensive development of 15-storey flats for a housing association. Built in prestressed concrete with prefabricated concrete units one-storey high, hoisted into position by tower cranes, these flats, which were district-heated, provided 3- or 4-room accommodation for close on 500 families. With a clay subsoil the foundations apparently did not exceed ten feet. It was particularly interesting to note that concrete units were being made on the site. The end units, measuring 8 ft. by 2 ft., consisted of a sandwich, the outsides being a facing of 1½ in. concrete with, in between, lightweight concrete with a lica aggregate some 5 in. to 8 in. thick.

Concrete manufacture and construction. The widespread development of concrete made our next visit of particular interest. We spent well over an hour touring the concrete factory of Larsen and Nielsen Limited which had started production some six years ago. Extensions were still taking place, the final overall area to be 400,000 sq. ft. Four bays for the manufacture of concrete units covered 60,000 sq. ft., two of the bays dealing with units up to five tons with one entirely confined to prestressed beams. The factory employs close on 150 men of whom 80 per cent. are unskilled.

In the prestressing bay there were eight beds 85 yards long, the biggest beams cast being in the region of ten tons. In a recent order for the SAS air terminal in Copenhagen, however, 100 beams were constructed, the biggest weighing 28 tons and measuring 80 ft. in length.

We were impressed by the excellent finish of the concrete, the shuttering being of high quality. The mix generally was a wet one, shuttering mostly being struck after three days. Reinforced concrete window frames (12 ft. by 15 ft.) for factory buildings were very carefully examined and certainly satisfied the most exacting member. Apparently the wood shuttering for these frames could be used 50 times. Experiments with plastic shuttering had not been wholly successful so far. Although all the cement used is made in Denmark most of the steel is imported from Britain, Sweden and Belgium.

Italian Tile Panels

Of particular interest were concrete panels measuring 27 ft. by 8 ft. to which, before the cement was set, small green Italian tiles from Cremona were affixed from transfer sheets. These panels were being used for an extension to the Tuborg Brewery in Copenhagen, which we visited later in the day. It was interesting to note that we saw similar tiles being used in Milan on our visit to Italy in 1953.

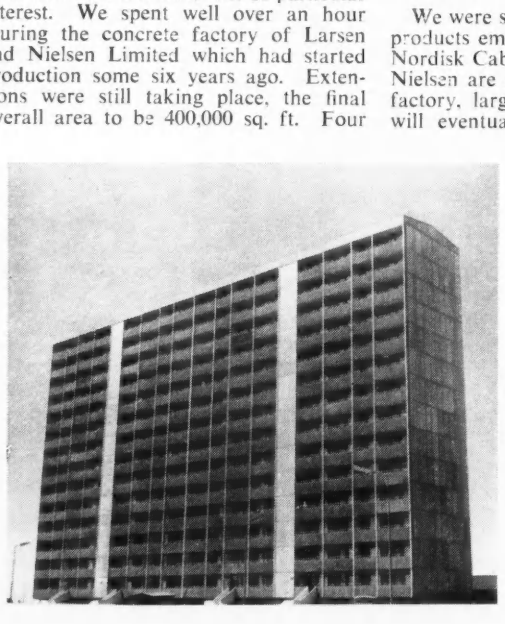
We were soon to see some of the firm's products employed in the erection of the Nordisk Cable factory which Larsen and Nielsen are designing and erecting. The factory, largely constructed in concrete, will eventually cover 2m. sq. ft. The columns in each building were cast *in situ*, prestressed skylights, window frames and other units being manufactured in the works we had just left. In the first factory block the beams had a span of 20 ft. but in a 350 ft. long block just being completed there was a span of some 50 ft. It was estimated that the cost of this most recent block without electrical and heating services would be 28s. 6d. per square foot.

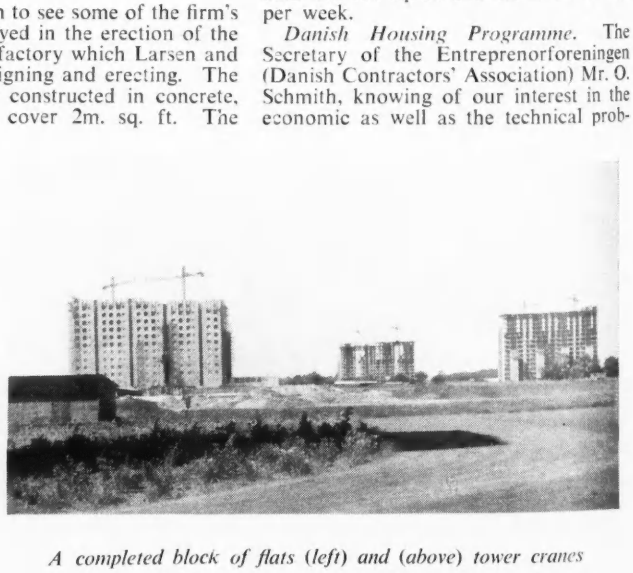
A concrete panel with green inlaid Italian tiles being inspected by members of the party. The group includes the Danish President (Mr. N. C. Guldmann) and the Eastern Federation President (Mr. R. E. Perrott)

Our interest in housing was further catered for by a visit to a two-storey block of 72 apartments at Rundstet some 15 miles from Copenhagen. These were constructed almost entirely in concrete, the surface of the inner skin being so smooth as to dispense with plastering. The bathroom was completely prefabricated and most of the units were factory made. Speed of erection was emphasised, the shell being erected in only two months with just over two months more to complete for occupation.

Each centrally heated flat had a living-room, kitchen, bathroom and bedroom, children not being catered for. The total area was 750 sq. ft. and the rent some £4 per week.

Danish Housing Programme. The Secretary of the Entreprenorforeningen (Danish Contractors' Association) Mr. O. Schmith, knowing of our interest in the economic as well as the technical prob-





A completed block of flats (left) and (above) tower cranes in use on tall flats at Rodovre, seven miles from Copenhagen

lems of housing, arranged a most valuable meeting with Mr. Niels Salicath, a senior official of the Ministry of Housing, through whose friendly co-operation it was possible to bring back some valuable information on the Danish housing programme which may be of general interest.

Approximately 20,000 houses are being built annually under the current Danish housing programme, some 12,000 through public housing agencies, including non-profit housing associations. The majority of this housing in urban areas is in flats, a method also favoured for private development, whose share is some 8,000 houses annually, a substantial proportion receiving state aid.

The organisation and finance of the housing programme is rather complex, but a brief review of the Government Aid to Housing Act 1955 may help to explain the set-up. Under this Act for example, the Minister of Housing is authorised to grant annually up to 1959, loans amounting to some £15m. Half of this is to be made available for non-profit housing, some 15 per cent. for low income owner-occupied houses and up to 27½ per cent. for loans for private building. There are in addition, provisions for subsidies for the lower income groups.

Extensive conditions for loans and subsidies are laid down by the Minister of Housing with particular reference to rents and tenancy conditions, town planning, standards of design, construction and equipment. Government loans, other than for private housing, are repayable by annuities, the first payment being deferred until 1971; the subsequent period for repayment must not exceed 45 years. For private housing loans, however, the repayment period must not exceed 35 years, there being no moratorium for repayment. The Act specifically refers to the interest rate for private housing loans which for detached and terrace houses is 4½ per cent. and for flats 5½ per cent.

In Denmark extensive use is made of credit associations and the 1955 Act provides that before a Government loan is obtained the greatest possible loan on first and second mortgage must be obtained from this source.

Loan Limits

Non-profit housing. At present up to £7½m. is made available annually by the Government for loans for 'non-profit housing' (mainly or exclusively for flats). The loan limit is 85 per cent. of the cost or market value of the property but this limit may, however, be raised to 94 per cent. if a municipal guarantee is available. The upper limit placed on the size of flats is 850 sq. ft., the stipulation being that the needs of the lower income groups must be met. A reasonable number of flats must also be made available for large families and the aged and infirm.

The non-profit housing organisations, e.g., co-operative housing societies, housing joint stock companies, etc., are subject to close supervision by the Minister of Housing. The by-laws of these organisations must, *inter alia*, provide that the housing needs of the lowest income groups are to be catered for, building shall be as economical as possible, any surplus shall be devoted to further building work and the duly audited accounts shall be submitted for the approval of the Minister of Housing. Rents, too, are subject to the Minister's control.

Detached and Terrace Houses. Over £2m. annually is available for loan purposes for the construction of small owner-occupied detached, semi-detached or terrace houses for the low income groups. The loan limit is 85 per cent. of cost or market value, but with a municipal guarantee the limit may be raised to 90 per cent. Detached houses, for example, must not exceed in size 1,000 sq. ft. and the cost is limited to some £2,000 in Copenhagen and £1,600 in the rural areas. If the house is constructed for sale the terms and the purchaser must be approved by the Minister. Loans may be made available on similar terms to municipalities, co-operative housing societies, etc., building with a view to sale.

Two-storey flats, or maisonettes, built in concrete at Rundstet, north of Copenhagen

Private Building

Private Building. Some £4m. in loan money is available annually for private enterprise building in several categories. For example, for flats where the floor area does not exceed 1,100 sq. ft. (houses 1,300 sq. ft.), the amount of the loan is calculated on the basis of the loan obtained from a first mortgage credit association, the rate of interest being 4½ per cent. and the repayment period 60 years. Together with prior mortgages, the Government loan must not exceed 75 per cent. of the market value of the property. There is a loan limit of 80 per cent. for flats for letting with a maximum floor area of 850 sq. ft., and 75 per cent. for detached and terrace houses. These percentages rise to 88 and 85 with a municipal guarantee.

Where the borrower is a building contractor the loan limit may be raised to 85 per cent. and if there is a municipal guarantee, to 90 per cent.

Subsidies. Up to 1967 subsidies are made available on a short term basis, the floor area limit for flats, for example, being a minimum of 500 sq. ft. If the area is below this the rate of subsidy is reduced to 60 per cent. For non-profit rented housing and owner-occupied houses for low income groups the annual subsidy is 11s. for every ten sq. ft. For private housing the figure is 8s. Over the subsequent seven years the subsidy is reduced annually by 1s. per ten sq. ft. in the case of non-profit housing and 9d. in the case of private housing, after which the subsidy ceases altogether. Where the floor area exceeds 850 sq. ft., no subsidy is payable on the excess. Although these subsidies apply to houses constructed under Government loans, the subsidy may be applied to comparable houses financed from other sources. Subsidies are also available for buildings for social or cultural purposes.

Up to £100,000 is available annually for capital subsidies of up to 15 per cent. of the cost of flats for the lowest income groups provided by non-profit housing organisations, subject to a corresponding subsidy by the municipality and a lower contribution by the organisation itself.

Provisions for Large Families. Special subsidies are provided for large families living in flats built by a municipality or a non-profit housing organisation by means of a Government loan. The flats must have not less than three rooms, conforming to the needs of the family; for example, in a flat occupied after January 1, 1950, there is a subsidy for those with three children under 16 of 35 per cent. of the rent with an annual maximum of £37 10s. For those with seven or more children the subsidy goes up to 75 per cent. with an annual maximum of £85. Applications for rent subsidies must be submitted by the tenant to the municipal council, the cost being shared by the municipality and the Government.

Conclusion

Throughout the tour one sensed a great feeling of friendship for Britain, despite the fact, as Mr. Guldmann reminded us at a farewell dinner in his honour, that we had bombarded their capital, sunk their ships and would not pay a good price for their bacon and eggs.

Certainly this visit, the fifth in the series, contributed to our knowledge of Continental constructional methods, as well as increasing the prestige of the Eastern Federation and adding our quota to international goodwill.

British Colour Council

SIR ERNEST GOODALE has been elected president of the British Colour Council, and Mr. H. G. Dowling chairman. The Council's colour service to members will be continued under the direction of Miss K. A. Battersby. The secretary is Mr. H. M. Blyth.

FIRE STATION

Wythenshawe, Manchester

LEONARD C. HOWITT, MArch, DipTP, DPA, FRIBA, MTPI, City Architect

FRANK ROBINSON, DFM, ARIBA, Senior Assistant Architect

MOSTON BRICK & BUILDING Co. Ltd., Builders

THE SITE of this fire station is in the area of Wythenshawe reserved for a civic centre and is in fact the first new public building to be built there. The station is central in relation to the housing and industrial development and is located close to a proposed ring road which will give speedy access to all parts of the district. The site is a corner site at the junction of two major roads and the station fronts on to the more important road with the return gate on the lesser road.

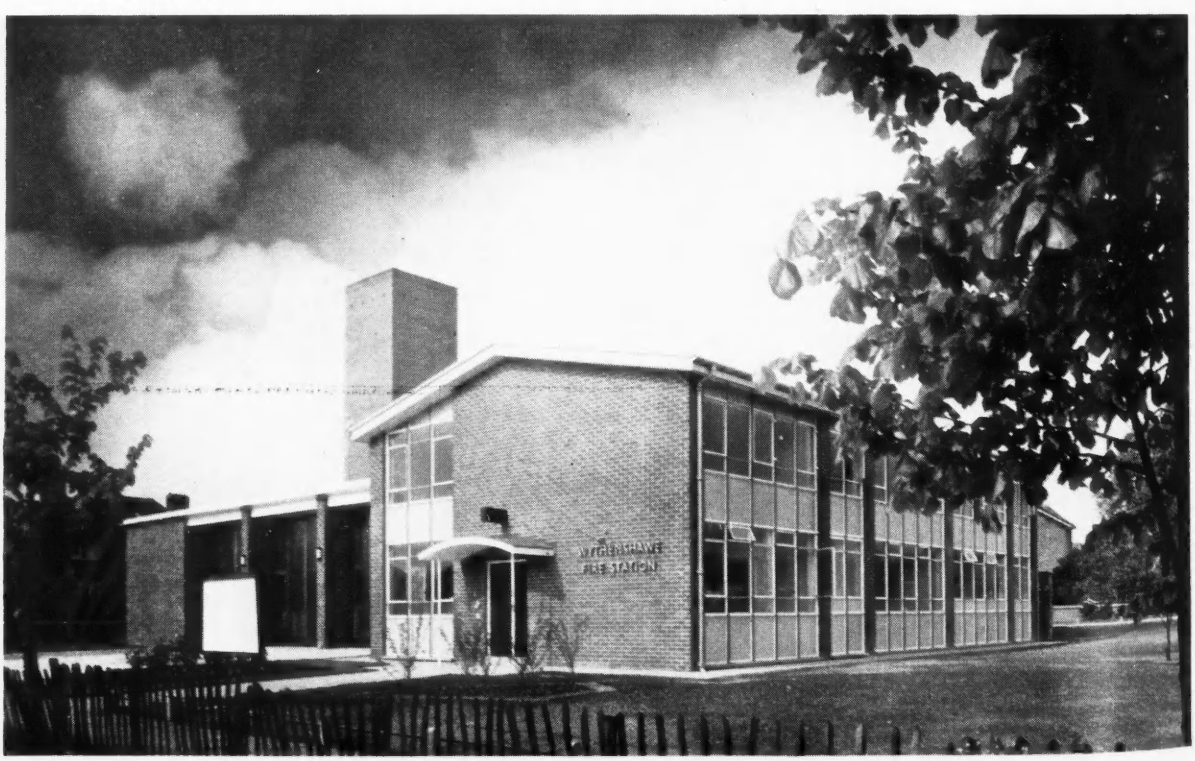
The station comprises a single-storey three-bay appliance room with a two-storey administrative and recreational section adjacent, and on the other side of the appliance room a single-storey workshop and repair bay block with a combined hose drying and drill tower *en suite*.

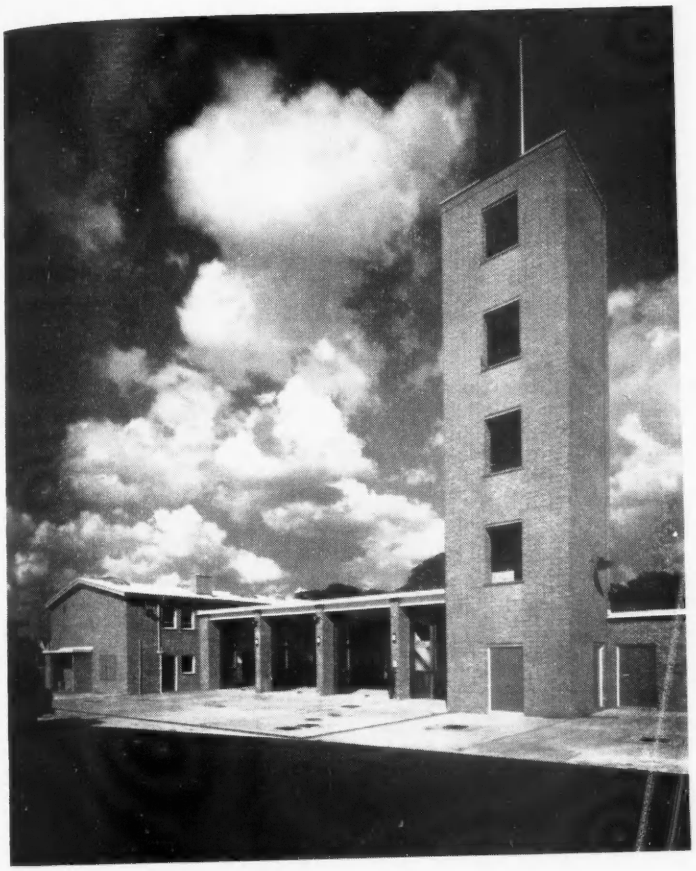
Generally, the construction is of load-bearing brickwork. Floors and flat roofs are of prestressed and precast concrete. The low-pitched roof over the administrative block is on timber trusses with wood-wool slabs and felt finish. Window frames are of metal as is the cladding to the north elevation. The appliance room floor is in 'Duramit' tiles; other floors are finished in linoleum or quarry tiles. The drill yard is surfaced in bituminous macadam. In the station watchroom, provision is made for a special panel for the automatic indication of fire in premises which have detectors installed. The contract figure for the building was £34.234.

Subcontractors & Suppliers:—

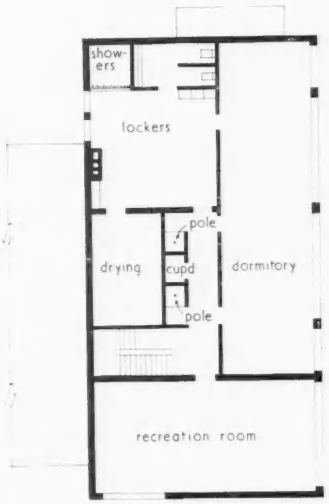
Plumbing and glazing, John Turton and Sons, Ltd.; heating installation, Dodd Engineering Co., Ltd.; painting, H. S. Hollinshead, Ltd.; metal windows, John Thompson (Beacon Windows), Ltd.; plastering, Thomas Bros., Ltd.; terrazzo flooring, etc., Conways (Tiles and Terrazzo), Ltd.; roofing, Neuchatel Asphalte Co., Ltd.; electrical installation, Frank Wall and Co., Ltd.; asphalting, J. E. C. Lord (Manchester), Ltd.; petrol storage installation, Dowson and Mason, Gas Plant Co., Ltd.; entrance gates, Robert Walker and Sons (Manchester), Ltd.; reinforced concrete floors and roofs, Concrete, Ltd.; boundary railing, Concrete Unit, Ltd.; door opening gear, E. Hill Aldam and Co., Ltd.; cycle racks, Constructors, Ltd.; metal letters, S. Newton and Co., Ltd.; metal doors, George Wragge, Ltd.; venetian blinds, Byroms of Altrincham, Ltd.; clothes drying equipment, James Sieber Equipment Co., Ltd.; hose hoisting gear, The Vaughan Crane Co., Ltd.

Main elevations



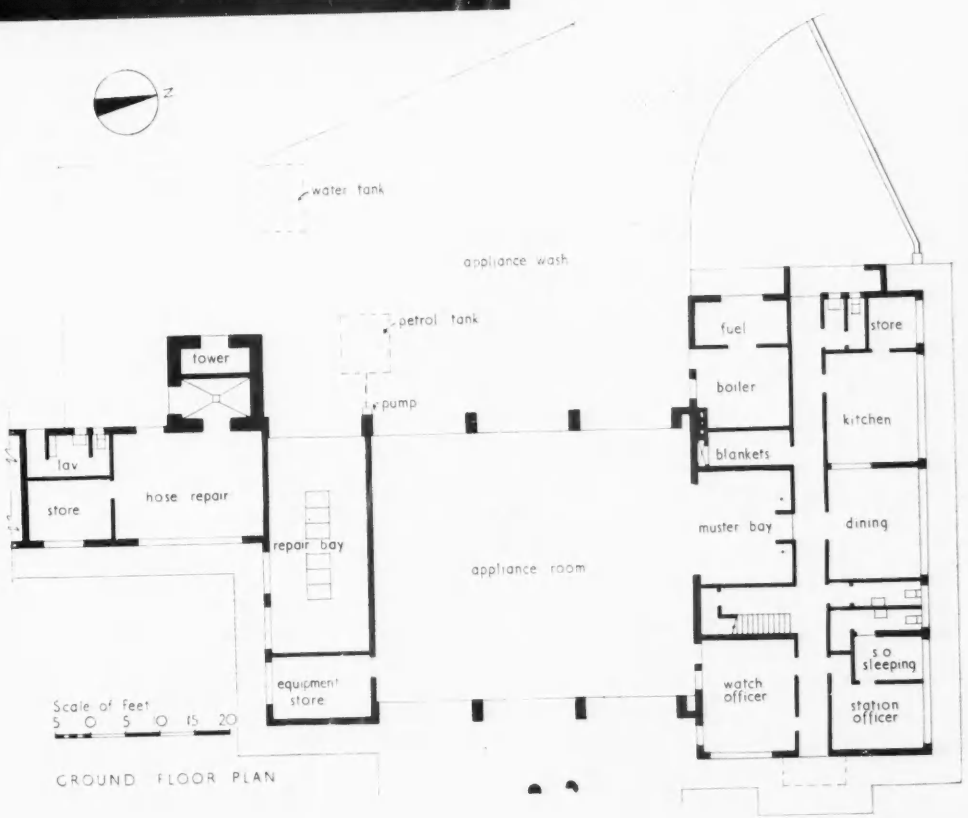


Rear view



FIRST FLOOR PLAN

Scale : 1 in. = 24 ft.



GROUND FLOOR PLAN

CORRESPONDENCE

Some Thoughts on the Conference

To the Editor of *The Builder*

SIR,—The discussion at the British Architects' Annual Conference (as reported in your issue of July 19) is of tremendous importance in the realm of design and construction of buildings. As in previous conferences several factors emerge of considerable general importance. That they do not always subsequently become diverted into the few specific channels for further investigation is to be regretted.

I imagine that as a manufacturer of building materials, I am in good company in attempting to appraise the trend of thought, and the changing methods of construction and materials present in the minds of our architectural leaders. If I am in such profuse company in regard to the methods necessary to implement new ideas, I shall indeed feel happy. I fear, however, that there is a measure of apathy which affects many of us soon after the reports of the yearly conference have been published. The fact that I have not mentioned the building contractor is not intended as a 'slight'; rather, it is indicative of the fact that the tendency is often to forget to seek the help and advice of this important branch of British industry when planning new methods and new materials. This is a great pity, for unquestionably the contractor is one of the team most suited to express an opinion based on working and wearing conditions.

Short of writing a book it is impossible to deal adequately with the several issues raised at Oxford in July. Owing to space limitations, I must content myself with a number of the salient points, and to express an opinion concerning the trend in some materials as seen through the eyes of one manufacturer.

First, the outline given by Mr. Thomas Mitchell concerning the money which must be set aside annually for repairs and renewals necessary to maintain buildings. There are, of course, recognised initial exterior treatments which, although involving greater capital outlay, minimise upkeep. The effects of the more recurrent items of upkeep are in many cases already being tackled on a widening scale by the 'Do It Yourself' movement. As I see it, costs have risen and are still rising to such an extent that more and more annual maintenance will continue to be carried out on a self-help basis. I cannot see a greatly reduced maintenance problem for some years, whether it be carried out by the building industry, the 'Do It Yourself' movement or a combination of the two. Nevertheless, however such work be done, it will call for materials which are frequently produced alongside, and with, materials for new projects, and the overall effect must have a steadying influence on some of the prices charged if only from the point of covering overheads. We must bear in mind that we have not yet made up the leeway lost during the war in regard to much maintenance work. There has not only been the time factor involved, but also the question of available credit to finance much repair work. Thus, to take maintenance work for any recent year is not entirely to refer to the specific maintenance rendered necessary in that year. The bringing back into 'full' use of many properties following the recent Rent Act will of necessity involve a considerable yearly expenditure in keeping-up many of the old properties in a state of repair commensurate with the intentions of the Act.

I wholeheartedly support the efforts towards methods for reducing upkeep, but I feel that we must not expect drastic changes overnight no matter how welcome they might be. Rather have we to consider cause and effect five years hence—maybe a decade ahead. Sufficient experience and testing under actual usage conditions have been gained in certain new techniques and materials to show the qualities and disadvantages. From this point, we have to go forward, and I would suggest that we must be prepared to think and act on some fresh lines. Much that is traditional is worth the keeping indefinitely, and a great deal that is new warrants further development. More important, to my mind, is a possible marrying of old and new methods and materials, particularly the latter so that the building industry obtains the best of both worlds. As one example of development on these lines the cladding of buildings offers considerable scope.

There are many other possibilities, but I doubt if they can be followed up unless there is increasing co-operation between all parties concerned. It is all very well for a designer to say: 'Give me something new which will be capable of meeting my clients' requirements; it must be cheaper initially, and show savings on maintenance; it must do more than previous materials in the same field, must be stronger, fully tested and so on.' That is a fine sentiment, but it is also a very tall order for the manufacturer to cope with. Development and testing of new materials is a lengthy process, and I would venture to suggest that in many cases 'real' testing can only be accomplished over the years under working conditions. Sufficient has been established over some post-war innovations to show that they are far from capable of living up to their sponsors' claim.

It is acknowledged that architects will carefully study the possible behaviour of new or unfamiliar materials, and be more systematic in their collection of information about the performances of materials and components in actual buildings. Further, that they will see that parts which of necessity wear out or require maintenance have accessibility commensurate with the frequency of the operation and its basic cost, bearing in mind the upward trend in wages. The illustration given by Mr. W. A. Allen of the Building Research Station concerning the predominant failure of paintwork which usually starts at a sharp arris where two flat surfaces meet at an angle is most striking. Mr. Allen pointed out that if all arrises were pencil rounded the paintwork would last at least a year, perhaps two years, longer. There must be many other instances where similar savings can be effected on maintenance, and equally important, in the design of work and components for the future. Although there has been a tendency for designers and producers and users to get together recently, I feel that it is becoming increasingly necessary for even more and closer liaison if maximum benefits are to be obtained in the future.

Unfortunately, I cannot suggest any new methods for a closer tie-up of interests, but I wish I could. At the present time, I am actively pursuing the development of a new type base and finish in cladding. I believe this may eventually have a definite impact on some sections of the building industry, but a lot of further work will have to be done before tests are finalised. This sort of testing involves a kind of security arrangement for obvious reasons. Yet, frankly, the very secrecy of the development may mean the overlooking of a vital link which could make the difference between complete or partial success. The answer to that poser may have to wait until the new method is on the market perhaps in great quantity. Then suddenly the architect or the builder, maybe a rival producer of a product akin to mine, will find an improved aspect to the problem.

That is how matters have 'progressed' in the past, and presumably we have to feel our way in the future to a considerable extent. Research has helped us a great deal and I am confident that it will continue to do so. I fear, however, that in many respects changes will come slowly and that many of the benefits resulting from them will come from the hard school of experience. Meantime, I should like to feel that each and every member of the building team will become increasingly conscious of the fact that what has been good enough in the past is not necessarily right to-day and that no matter whether in the open or under a bushel, the light of new efforts will continue to shed an increasing brilliance.

G. CUTMORE DRUMMOND.

Southend-on-Sea.

'German Recovery'

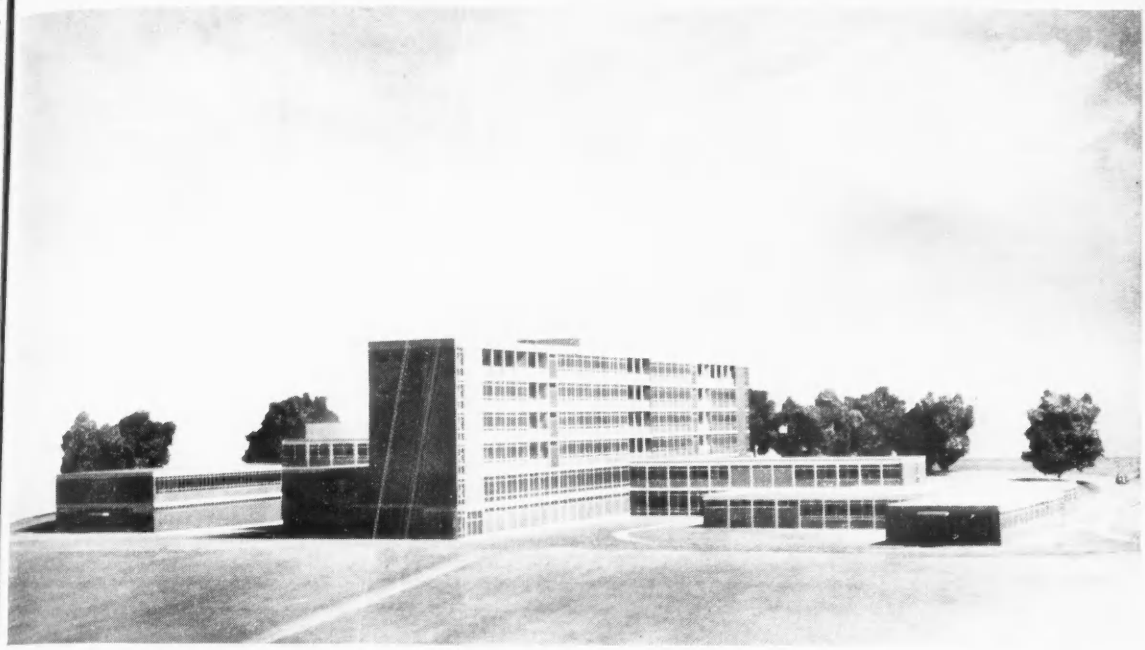
A Perennial Puzzle

To the Editor of *The Builder*

SIR,—I was astonished to learn recently that only 1,200 of the 19,000 Registered Architects subscribe regularly to the Architects' Benevolent Society. Can anyone tell me the reason for this? The profession is to-day probably more prosperous than it ever has been. Surely there cannot be 17,800 practitioners so hard up as to be unable to spare a small regular sum for their own charity.

If only half of these non-subscribers were to contribute as little as a guinea a year under a seven-year covenant it would mean another £16,000 a year for the ABS—and probably the end of distress in the profession. As you suggest in your note, let us all search our consciences.

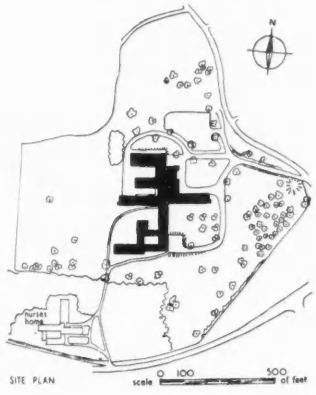
HOPEFUL.



PROJECT:

HOSPITAL, HARLOW NEW TOWN

for the North East Metropolitan Regional Hospital Board



Architects: EASTON & ROBERTSON
in association with W. G. PLANT, FRIBA,
Regional Architect to the Board

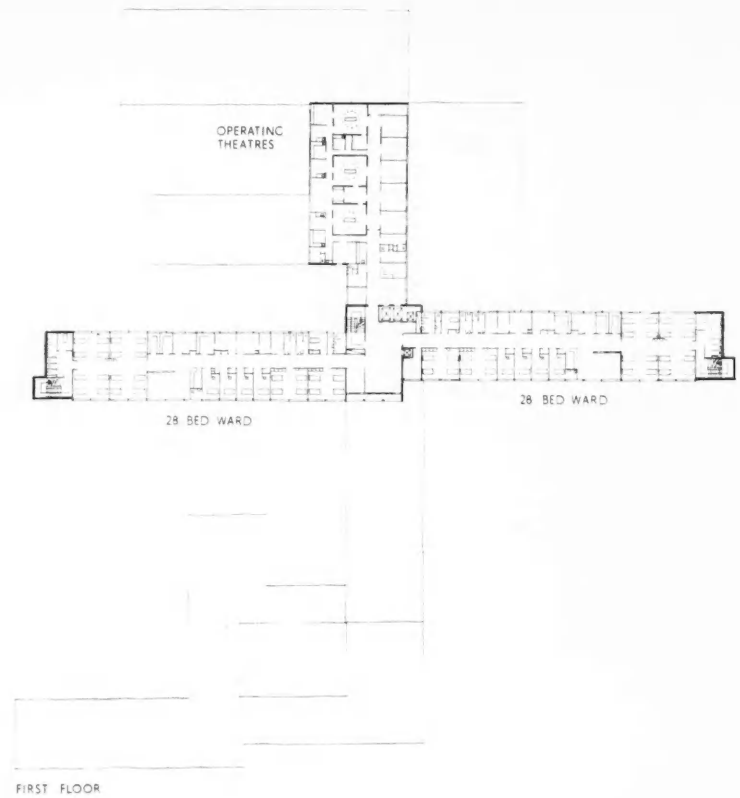
Quantity Surveyor: HAMILTON H. TURNER

AFTER very careful study of all the relevant factors, the Ministry and the Regional Hospital Board decided that a hospital of 244 beds with all necessary departments should be planned at Harlow New Town. The architects were asked to plan a hospital comprising six standard ward units of 28 beds each, a special surgical ward of 20 beds, a children's unit of 20 beds, a maternity department of 36 beds with an ante-natal clinic adjacent, an out-patient department, a casualty department with special fracture and orthopaedic clinic accommodation, a pathological laboratory, diagnostic X-ray physiotherapy and occupational therapy departments, operating theatres, and the usual administrative departments and offices, in such a way that if, in the future, extension of any of the main departments became necessary they could be extended, and if additional beds were needed, ward units could be added.

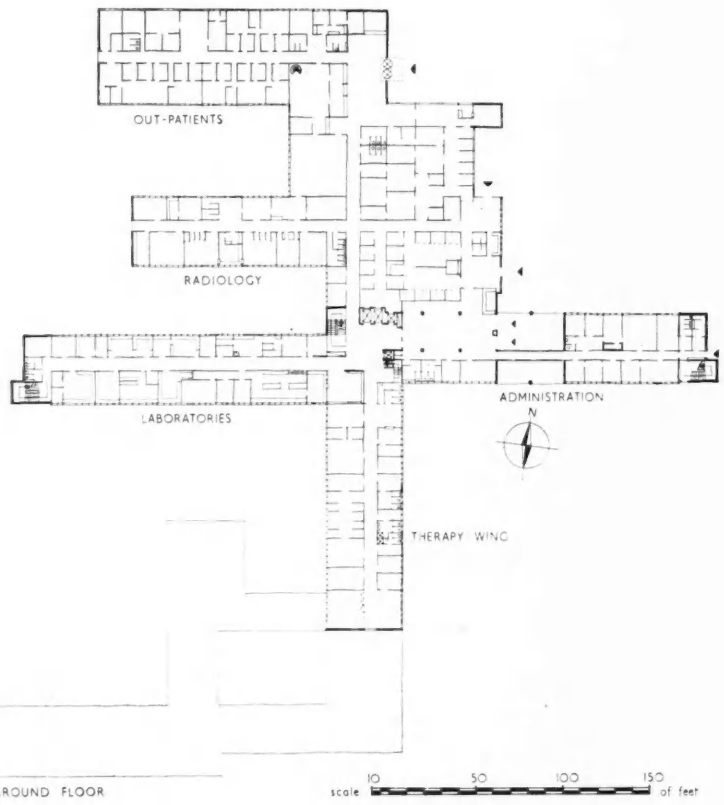
The main ward accommodation will be provided in a five-storey block with two wards on each floor above the ground floor. The pathological laboratory, administrative offices and dispensary will be on the ground floor under the ward units, and the out-patient, casualty and X-ray departments will be in single-storey buildings on the ground floor. Operating theatres will be on the first floor over a main corridor and part of the casualty department.

The domestic service departments and a central sterilising department, which will supply sterile

Project: A Hospital for Harlow New Town



FIRST FLOOR

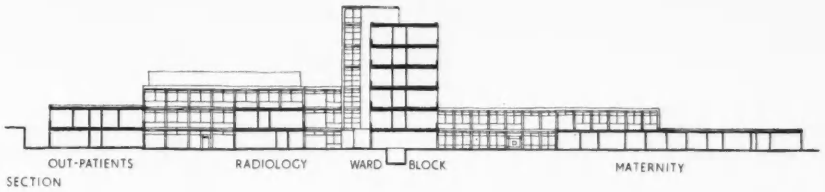


GROUND FLOOR

PLANS
Scale : 1 in. = 96 ft.

scale 10 50 100 150 of feet

SECTION FROM SOUTH TO NORTH LOOKING WEST

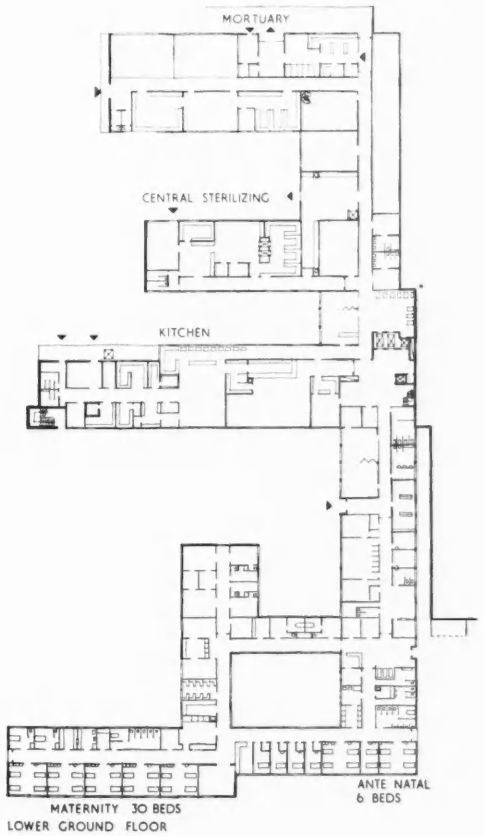


SECTION

FOURTH FLOOR

WARD FLOORS 2nd and 3rd

PLANS & SECTION
Scale : 1 in = 96 ft



LOWER GROUND FLOOR

dressings and instruments to all the wards and departments, will be on the lower ground floor.

Each of the main departments of the hospital has been planned in buildings with a free end, so that any of them can be extended if necessary at a later date without interrupting the services of the hospital.

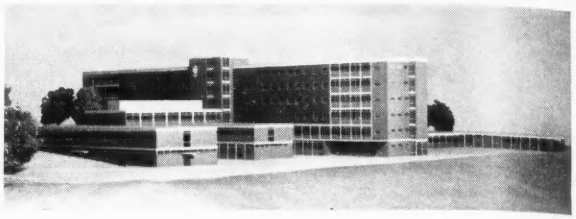
The new hospital will be approached by a by-road off Fourth-avenue, and the well-treed site with natural meadows provides a park-like setting to the new hospital.

It is intended that the hospital will be built in red brick of two tones, and the general elevation and sky-line have been designed to harmonise with the architectural design of the main buildings of the new town centre.

In the ward units the patient accommodation is provided at the end and on the southern face of the block. Each 28-bed unit has one 16-bed ward, two four-bed wards and four single-bed wards. The beds will be parallel to the windows and special care has been taken to allow for ready observation by the nursing staff throughout the ward unit. Particular care has been taken to avoid the proximity of the noisier ancillary rooms to rooms occupied by patients.

Cupboard space in each ward will

Project: A Hospital for Harlow New Town



A view of the model from the north-west

allow for retention of patients' clothing and the provision of a generous sized day-room near to the ward kitchen allows for the current practice of early ambulation for many hospital in-patients.

From an area near the central lift well a linen chute provides for the removal of foul linen to a receiving point in the lower ground floor from which it is conveyed to the foul linen collecting room for removal to a laundry.

The sub-division of each ward unit, and a careful disposition of sanitary accommodation will provide the maximum flexibility in the use of these units, since, with this sub-division, patients of both sexes, and, if necessary, patients of various clinical departments can conveniently be treated in the same unit.

The maternity unit will be separate from the main hospital block, and will have its own entrance and approach road from the main courtyard. It provides for 30 lying-in beds and six ante-natal beds, but the disposition of the sanitary annexes makes it possible to extend the facilities to either category as the need arises. Accommodation is provided for premature babies, adjoining the delivery suite, and two isolation rooms are situated at the far end of the ward wings.

The board are satisfied that when it is possible for the hospital to be completed, it will fully meet the permanent needs of the residents of the new town and the adjacent area.

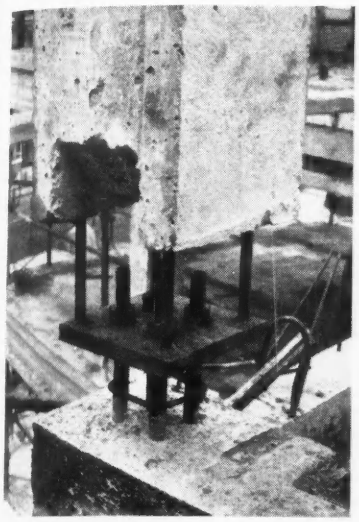
The architects propose to divide the work of providing the first stage of the hospital into two contracts which will proceed concurrently, viz., a contract for the site formation and a contract for the building. It is expected that the site works will be started before March, 1958, and the buildings some time before December, 1958. The work on the first stage is likely to be completed in the early part of 1960.

It is estimated that the total cost of the new hospital will amount to about £2,000,000, and the first stage comprising out-patients and casualty departments with appropriate ancillary buildings will cost approximately £500,000.

In the medical planning of the hospital the board's Senior Administrative Medical Officer, Dr. James Graham, has had the assistance of a working party composed of medical and lay members of the Regional Hospital Board and the Epping Group Hospital Management Committee.

A view of the model from the north

PRECAST FRAMED FLATS BARKING, ESSEX



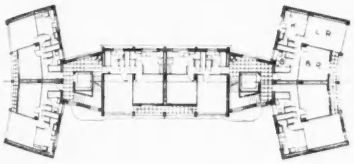
Method of splicing columns

C. C. SHAW, BArch., FRIBA
Borough Architect

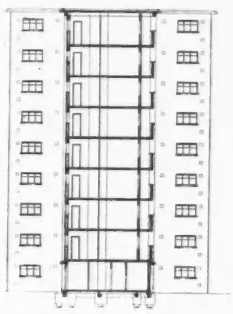
C. HARPER, B.Sc., MICE,
Borough Engineer & Surveyor

RADFORD & Sons,
Consultants for Drainage

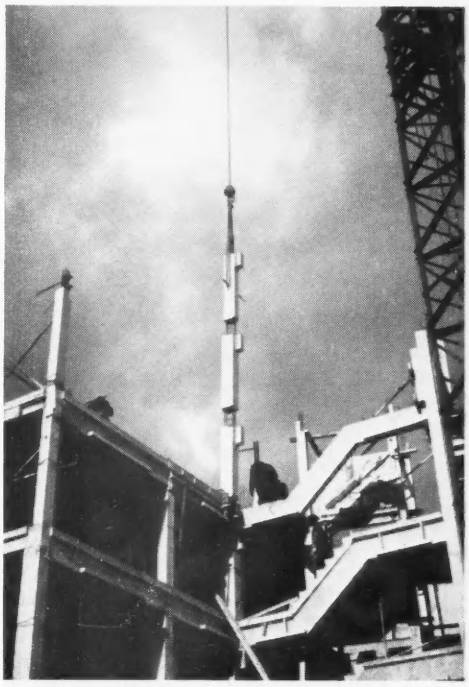
CARLTON (Contractors) Ltd.
Builders



TYPICAL UPPER FLOOR PLAN



CROSS SECTION



Three-floor column section in course of erection next to precast staircase and floor units

AMONG the flats being erected on the Thames View Housing Estate, Barking, Essex, are three nine-storey blocks with precast frames, floors and staircases. Each block contains 48 one-bedroom flats. All internal partitions are hollow clay blocks, windows are metal, the one-pipe system of plumbing is used and the flats are all-electric, although provision has been made for cooking by gas.

One of the more interesting details in the design of a precast multi-storey frame is the column splice. This is not designed to carry any load other than that due to erection. Adjustments to the position of the column to ensure that it is dead plumb and the right distance from the one beneath are made by threaded splice bars and a splice plate. When the column is in position an *in situ* concrete infilling transmits the full load. One complete structural floor was erected every 10 days; this included columns, beams, *in situ* stiffening walls, flooring (using wide slab precast floors) and stairs.

Subcontractors & Suppliers:—

Precast concrete frames, suspended floors and roofs, Concrete, Ltd.; piles, West Piling Construction Co., Ltd.

The completed frame of No. 2 block

PRESTRESSED CABLE STRUCTURES

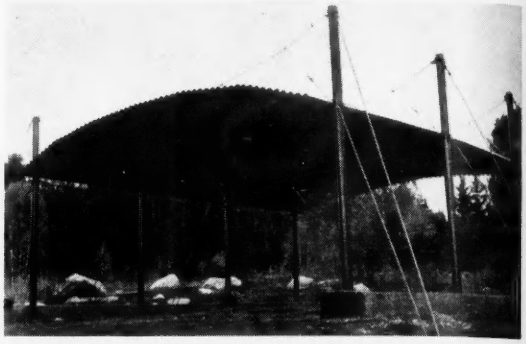
The 'Jawerth' System

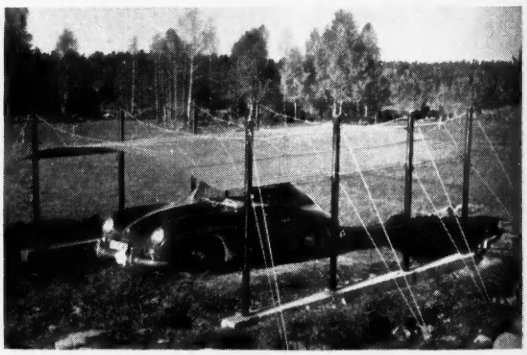
DAVID JAWERTH, SBR,
Consulting Engineer

This structural system was fully described with a detailed calculation and theoretic analysis in the Swedish paper " Byggnads Ingenjören," No. 2, last year. It is fully patented.

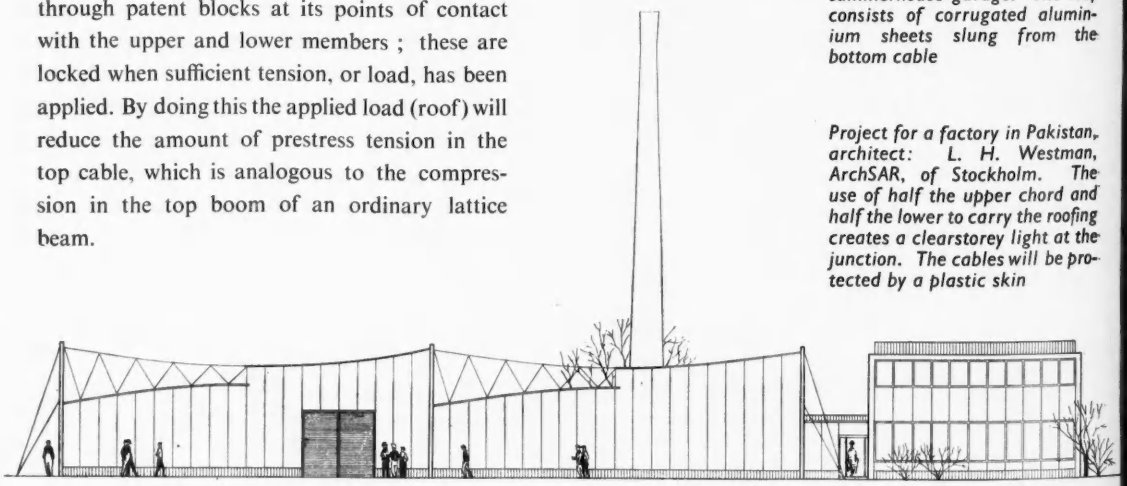
DURING recent years structural designers have been increasingly interested in wider spans. This contribution from Sweden is a development that reduces the structure to a minimum, thereby reducing the dead load. This has been achieved by making a supporting cable acquire the form of a line polygon related to the loads it will have to carry. Among the advantages of this method of design is that the calculations can be limited to one plane; space-frame theories do not apply.

The system may be explained thus: the main 'girders' are in reality lattice trusses fixed to supports and made up of three cables. One forms the top boom, one the bottom, and the third the diagonals. The whole is then prestressed by pulling the third or diagonal cable tight against the end columns or supporting structures which are securely anchored by guys, mass foundations, etc. The diagonal cable runs through patent blocks at its points of contact with the upper and lower members ; these are locked when sufficient tension, or load, has been applied. By doing this the applied load (roof) will reduce the amount of prestress tension in the top cable, which is analogous to the compression in the top boom of an ordinary lattice beam.



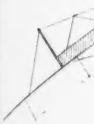


Three views of the prototype, a summerhouse garage. The roof consists of corrugated aluminium sheets slung from the bottom cable

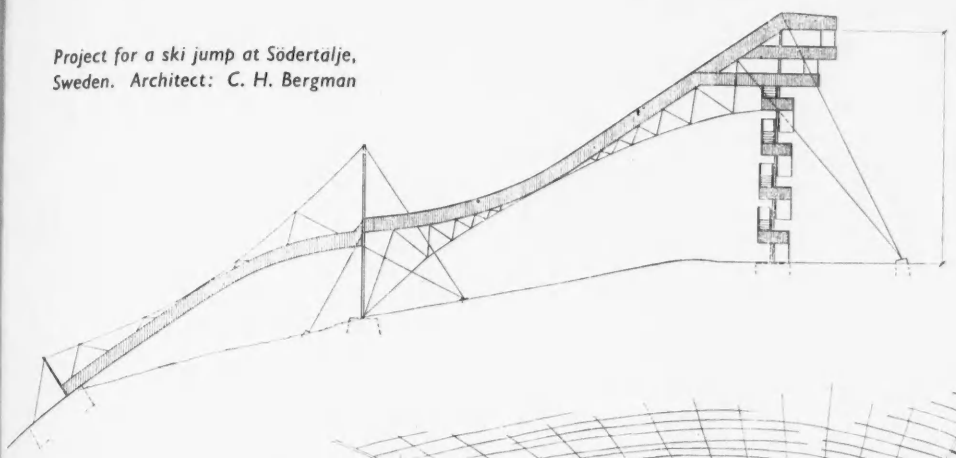


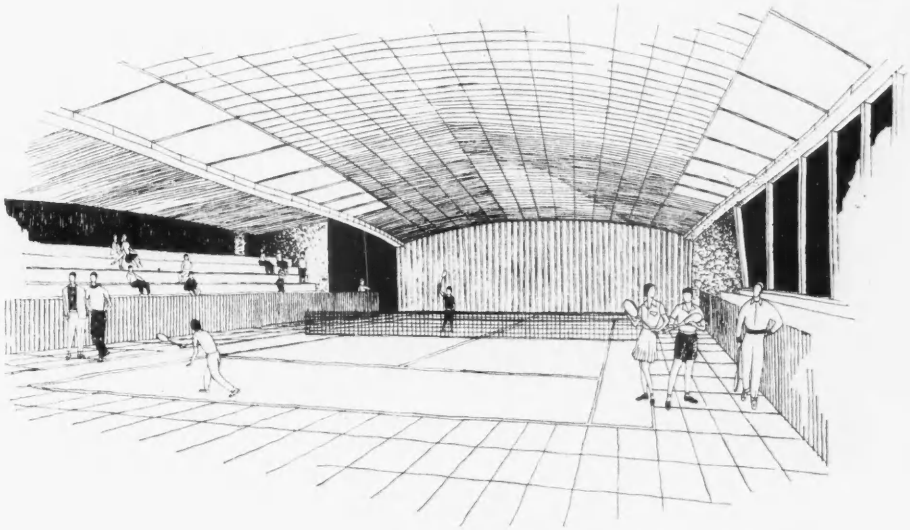
Project for a factory in Pakistan, architect: L. H. Westman, ArchSAR, of Stockholm. The use of half the upper chord and half the lower to carry the roofing creates a clearstorey light at the junction. The cables will be protected by a plastic skin

Projec
Swede

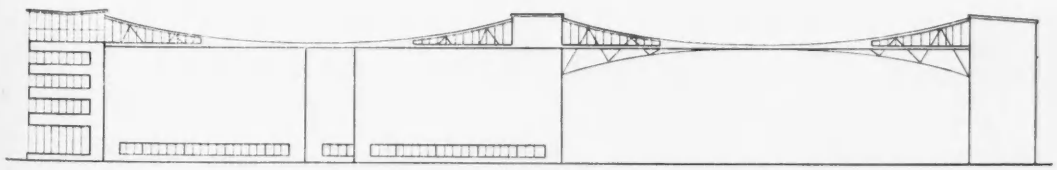


Project for a ski jump at Södertalje, Sweden. Architect: C. H. Bergman

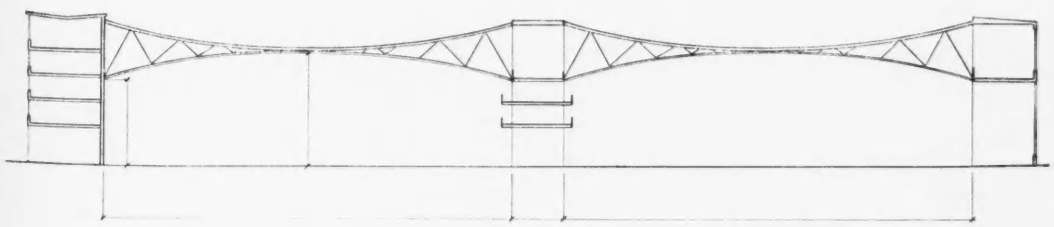




Covered sports stadium at Värnamo, Sweden (architect: Tore Moxness, ArchSAR), has a free area of 30m by 40m.



Elevation, a project for aircraft hangars at Stockholm, with a free span of 50m. Architect: Milo Huttner of Stockholm



Cross section through hangars; it is claimed that the dead weight of such a roof can be greatly decreased by normal standards

News of the Week

RIBA Council, 1957-58

THE RIBA has now issued a complete list of the Council for 1957-58 in which the gaps in the earlier lists (see *The Builder*, June 28 and July 5) are now closed. The latest appointments are: Two representatives of the RIBA Salaried and Official Architects' Committee, Dr. F. F. C. Curtis, ARIBA, and Mr. F. G. Southgate, ARIBA; fourth representative of Allied Societies in Scotland (nominated by the RIAS), Mr. J. A. Carrick, FRIBA (Ayr); second representative of Allied Societies in Ireland, Mr. J. D. McCutcheon, LRIBA (Royal Society of Ulster Architects).

Saltire Society's Award

THE Bowery housing scheme for 50 houses in the royal burgh of Leslie, Fife, for which the architects were Messrs. Wheeler and Sproson, AA.RIBA, has won the Saltire Society's housing design award for local authority housing completed in Scotland in 1956.

Architects' Fees, Singapore

AN AMENDMENT to the Architects' Ordinance in Singapore was moved in the Legislative Assembly recently by Mr. Francis Thomas, the Minister for Communications and Works, with the aim of scrapping the system of a minimum scale of architects' fees. The amendment was passed unanimously, and as a result architects will no longer be able to charge a minimum fee of 7½ per cent. of the cost of a building project, or to recover 5 per cent. of the total cost of the project if it is abandoned.

Mr. Thomas said the amendment would allow for keener competition.

Theatre Royal, Birmingham

THE old Theatre Royal, Birmingham, closed last December and now in process of demolition, is to be replaced by a new theatre to seat 1,900-2,000, which is to be built for Moss Empires, Ltd. The architects are W. S. Hattrell & Ptnrs., F/ARIBA, of 1a, Queens-rd., Coventry.

Bombed Church as Concert Hall

DISCUSSIONS are taking place with the church authorities on plans to convert the bomb-damaged Church of St. John, Smith-square, Westminster, into a concert hall to seat 1,500. A company called St. John's, Smith-square, Preservation, Ltd., has been formed by Mr. Louis Osman, FRIBA, who hopes that the building may take the place in music which was held by the Queen's Hall. Lord Harewood is reported to be one of the directors of the company. The cost of conversion is estimated at £250,000.

Professional Announcements

MESSRS. P. R. MIDDLETON & PARTNER, chartered architects, have now moved their offices to 111/113, Albert-road, Middlesbrough. Tel. (unchanged) Middlesbrough 44443.

MR. J. LANGDON, BSc, AMICE, has been appointed a lecturer at the Portsmouth College of Technology, where his subjects will include civil engineering and building construction. Trade catalogues and other relevant literature would be welcomed.

COMING EVENTS

FRIDAY, AUGUST 16.

INTERNATIONAL SOCIETY OF SOIL MECHANICS AND FOUNDATION ENGINEERING.—Fourth conference. Institution of Civil Engineers, Great George-st., SW1. Continuing until August 24.

THE NATIONAL TRUST FOR SCOTLAND.—Festival Exhibition. Royal Scottish Museum, Chamber-street, Edinburgh. Open daily, until September 14 (except Sundays) from 10 a.m.-5 p.m.

MONDAY, AUGUST 19.

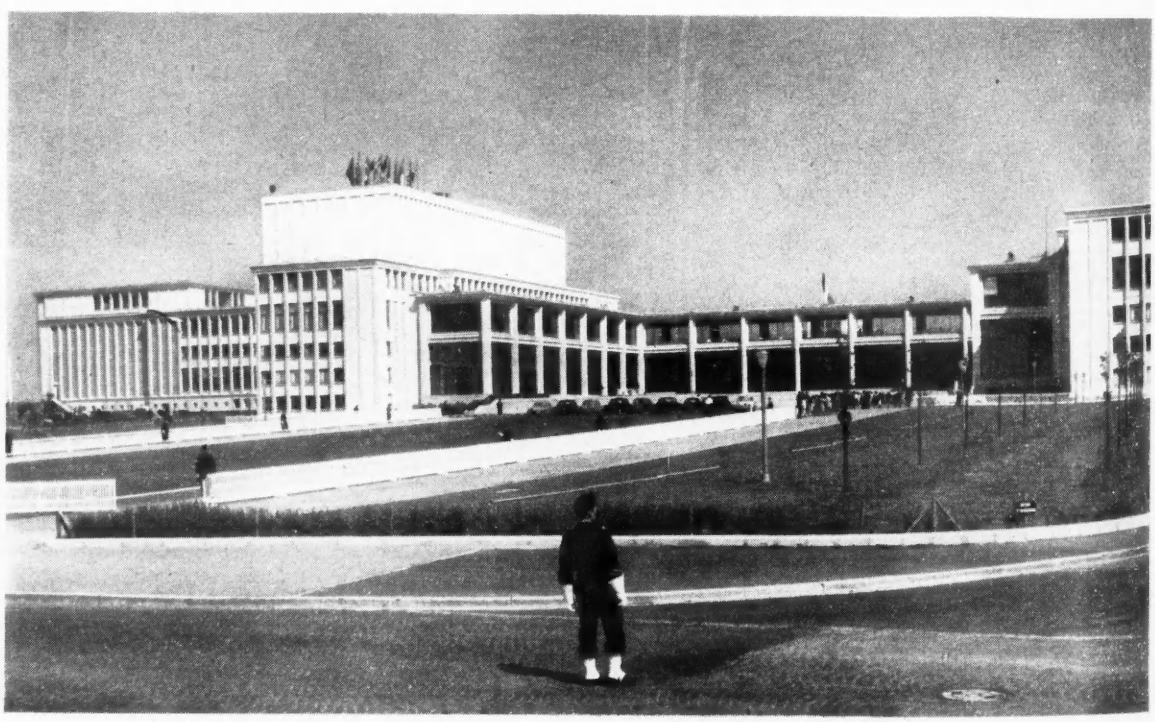
CENTRAL COUNCIL FOR THE CARE OF CHURCHES.—Post-War Church Buildings Exhibition. Cathedral Crypt, Rochester. Continuing until August 31.

FROM 'THE BUILDER' OF 1857

Saturday, August 15, 1857

THE WELLINGTON MONUMENT IN ST. PAUL'S.—The monument of Nelson, from the hand of Flaxman, exists on one side of the entrance to the choir in St. Paul's. Does not taste indicate that of Wellington to occupy the opposite place? That of Cornwallis now fills the space, but he whom it records is not buried beneath it.

At any rate, this would be the popular spot for the monument to Wellington; but it is more evidently judicious now, inasmuch as the sculptural resources of this country and Europe have been called on to produce a design for the memorial suitable to the place that was proposed in the conditions of the competition. Eighty-three models were sent in and not one is recommended to be carried out? Not so. There were many beautiful things there, but the choice of the site was incorrect.—EPSILON.



CAEN UNIVERSITY.—Caen University suffered severely in the Calvados landings, and has been rebuilt. The new buildings were opened on June 1 by Queen Elizabeth of Belgium. Our photograph shows the main courtyard with, on the left, the Library

Building and Road Research in 1955-56

ANNUAL REPORT OF THE DSIR

THE Annual Report of the Department of Scientific and Industrial Research for the year 1955-56 (HMSO, price 9s. 6d.), includes a number of items of interest to the building and civil engineering industries in the summaries of the work of the various research establishments of the Department, extracts from which are given below.

Building Research Station

Cost of Building Flats.—A growing proportion of dwellings is being designed in the form of blocks of flats of six storeys and over, but experience so far has been that the costs are higher than for similar accommodation in two-storey housing, by as much as 70 or 80 per cent. An analysis of the cost of over 70 current designs, based on the contractor's estimated price for the job, has, however, shown that prices could be reduced by as much as £450 per flat by combining the economic features of the different designs. A reduction of this magnitude would not require either new materials or new techniques, but still further economy may be possible by improvement of methods employed in production on the site. Data are therefore being collected on the methods used for the main operations involved in the construction of multi-storey flats, such as concreting and plastering.

Climbing Cranes in Tall Blocks.—Hitherto few blocks of flats have exceeded 11 or 12 storeys in height, but blocks of around 15 to 20 storeys are now envisaged by some authorities. The construction of these presents special problems from the point of view of handling materials, transport of labour and the general organisation of the work. Of particular interest for blocks of this height are the light climbing cranes which are now being used on the Continent. These cranes are mounted within the building itself and climb with it as it grows. For a given reach, the crane can cover a greater area of building than can cranes mounted alongside and consequently for any required coverage of the work the climbing crane is both lighter and cheaper than other types. The Station has purchased such a crane which, after undergoing stability tests, is now being used on a multi-storey building.

Costs of Plant Operation.—In order to decide whether to mechanise a particular building operation and, if so, whether to purchase or to hire plant, it is necessary for a contractor to have available the total costs of plant operations. These include not only capital costs and hire charges, which are usually readily ascertainable, but also the maintenance costs, useful working life and likely utilisation for which data have hitherto not generally been available. Such information could, in any case, only be collected from a large sample of plant, and, therefore, required a survey of the experience of a number of large contractors. The Station has carried out such an investigation and as a result has been able to publish, for use by the industry, the total cost of all the main items of mechanical plant at present in use.

BRS Scottish Laboratory

Moisture Movement of Aggregates.—The investigation of the moisture movement of natural rock aggregates for concrete, started a year ago, has already shown that different rocks of the same nominal type can vary considerably in the extent to which they shrink on drying. Shrinkage of the aggregate has been found to increase that of the concrete made from it, sometimes sufficiently to lead to early deterioration of the concrete, especially in precast units, on exposure to the weather. The investigation is being pressed in view of its obvious importance.

Brick Production.—Enough common bricks are now being produced in Scotland to meet the current demand and the makers are able to pay further attention to quality control and the development of new types, such as facing bricks and perforated bricks. Several new or improved makes have been submitted for examination and reports issued to the manufacturers.

Thickness of Walls.—To conform with the revised by-laws, walls in three- and four-storey flatted dwellings can be thinner than they were formerly required to be, provided that they are tied in by the floors and roof and that all load-bearing walls are bonded together. This makes possible a considerable reduction in the number of bricks or blocks used. A memorandum issued by the Department of Health for Scotland in collaboration with the Station explains the principles and details of construction and is now being used by all sections of the industry.

Road Research Laboratory

Soil Stabilisation.—The stabilisation of soils to form road bases has been the subject of research for a number of years, and the process is now being used on an increasing scale with cement as the binder. This is leading to considerable economies in construction costs. Ten per cent. of cement is normally added to the soil, but recent laboratory work has indicated that with gravelly or sandy soil further economies can be safely made by reducing the cement content to 5 per cent. or even rather less. This use of low cement contents is of particular value in overseas territories where winters are not severe.

Progress has been made in the stabilisation of soils with a high clay content. Success is linked up with the achievement of a fine crumb structure; this may be facilitated by the use of hydrated lime with the cement.

Compaction.—In the continuing study of soil compaction the performance of a wide range of machines has been investigated, and attention is now being given to the more basic aspects of the subject so as to provide manufacturers with useful data. The effects of the type of tyre, the inflation pressure, and the total load on the performance of heavy pneumatic-tyred rollers up to 20 tons weight have been examined; the energy requirements have also been ascertained for types of machines using dropping weights.

Moisture Content.—The importance of the moisture content of the soil in determining its load-bearing characteristics has led to further field experiments to examine the theories developed regarding the factors influencing its movement and distribution. In collaboration with the Air Ministry, and as part of the colonial research programme, the soil under runway pavements is being studied at a number of overseas airfields, where climatic conditions differ markedly from those in this country.

Fuel Research Station

Reduction of Air Pollution.—The Fuel Research Station has intensified its efforts towards the efficient utilisation of the more plentiful coals, including those of small size and comparatively low quality, with the main object of conserving the less plentiful coals of special characteristics. Work is also in progress towards the more efficient combustion of coals of several types. Application of the results of these researches should lead to a reduction of air pollution by smoke, grit, and oxides of sulphur. Greater attention has also been devoted to the measurement of air pollution and to helping the various medical authorities in their efforts to ascertain the effects of the different pollutants on health.

Measurement of Air Pollution.—Under the scheme whereby regular measurements of air pollution are made by local authorities and other bodies, in co-operation with the Department, the number of instruments in use at March 31, 1956, reached a total of 2,061, and the number of co-operating bodies making measurements increased to 224. During the year under review a Report on Observations for the Ten Years ended March 31, 1954, was published; the analysis of the results showed that while there has been a general increase in the pollution of the atmosphere by grit and dust during the last 15 years, there have been small decreases in the pollution by smoke and by oxides of sulphur. The degree of pollution in industrial areas is illustrated by observations made in the ten years 1944-54, which show that in the 'black areas' the amounts of pollution by grit and dust, smoke, and sulphur dioxide are generally 20 to 40 times the amounts in the rural or semi-rural areas where measurements are made.

Effects on Mortality. — Air pollution during periods of fog in large towns has attracted a great deal of attention in recent years, as the conditions are such that the health of persons suffering from respiratory diseases deteriorates rapidly and the death rate increases. It was thought that the concentration of pollutants might vary rapidly both from time to time and from place to place in these fogs. In an attempt to obtain data on the variations that might be useful to the

medical authorities, tests for making 'instantaneous' measurements were adapted for the purpose and teams of volunteers were organised during the winter of 1955-56, to make measurements during persistent fog in London and several cities in the provinces. The results showed wide and rapid fluctuations, the concentrations of smoke and sulphur dioxide ranging from very small amounts to as much as two or three times the overall average values for the period of the fog. When the death rates given by the General Register Office were compared with the observed pollution in the different districts of London a correlation between mortality and degree of pollution was found.

Concentrations of Carbon Monoxide. A survey has also been made of the concentrations of carbon monoxide in London streets as part of an investigation of pollution by the exhaust gases from motor vehicles. The greatest concentrations observed in open streets with heavy traffic were from 50 to 80 parts per million, but in Blackwall Tunnel concentrations as high as 500 parts per million have been found at times of exceptionally heavy traffic. Although this is below the danger limit for short exposures for healthy subjects, there may be some detrimental effect, particularly on susceptible persons.

Measuring Smoke Densities.—If the emission of smoke into the atmosphere is to be limited it is desirable that a sufficiently accurate but simple method of measuring the density of the smoke should be available. Experimental work has therefore been carried out to provide data on the measurement of smoke discharged from chimneys. This work is partly in association with committees of the British Standards Institution, which were formed in accordance with suggestions made in the Report of the Committee on Air Pollution. In that report 'dark smoke' was defined as smoke of density equivalent to or greater than No. 2 on the Ringelmann Chart. Although the apparent darkness of smoke is influenced by atmospheric conditions and by the colour and size of the smoke particles, there appears to be some degree of correlation between the Ringelmann Chart reading and the optical density of the smoke as measured in the flue or chimney. It is hoped that further tests in progress will provide data that will enable manufacturers to supply instruments which without previous calibration will give an appropriate reading when smoke of Ringelmann No. 2 density is made at a particular plant.

Other Items of Interest

Among other items of interest in the report are:

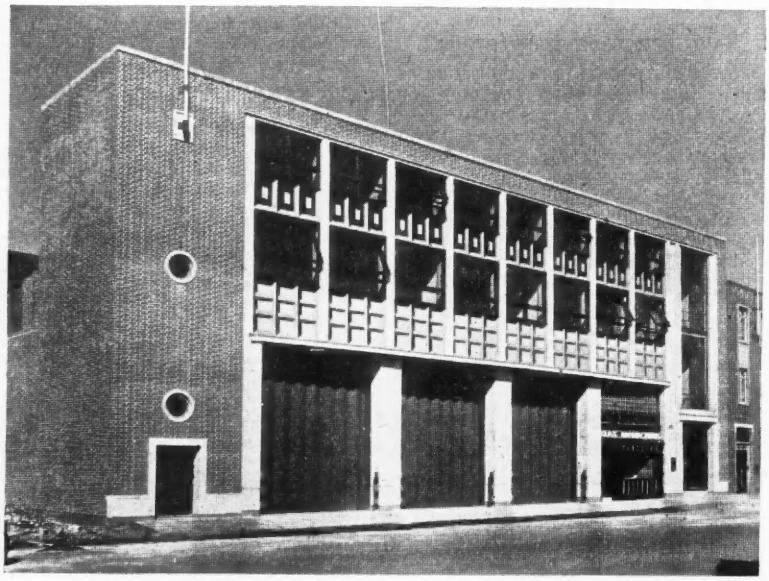
Spray Taps for Wash Basins Save Water.—In an office building taps that gave a spray instead of a continuous stream saved half a million gallons of water and halved the fuel bill for hot water. The taps were more hygienic and also more acceptable to the staff working in the building.

Aircraft Noise.—Research on noise from aircraft is leading to information of value to architects and planners.

Research on Factory Design.—Research in co-operation with the Midland Regional Board for Industry aims to provide authoritative data on the most suitable and economic forms of factory design and construction.

Chimney Fires.—Fires in chimneys have increased tenfold since 1947. The reason for the increase is still not known.

Summaries of the work of a number of grant-aided research associations are also included in the report.



BRISTOL BUILDING: A new office block to the Pilkington Bros. Ltd. depot, St. Thomas-street, Bristol. Designed by Mr. Ralph H. Brentnall, MBE, ARIBA.

BUILDING RESEARCH IN SOUTH AFRICA

European Housing

From a Correspondent

ACCORDING to the annual report of the South African Council for Scientific and Industrial Research the emphasis of work on housing, which has hitherto been concentrated on various aspects of accommodation for the urban Bantu, has now been shifted to housing for Europeans in the lower income groups. This, like Bantu housing, will be a long-term project but results should be available in a shorter period as much of the research undertaken for the former is applicable to the latter.

As a corollary to work on native housing, the National Building Research Institute carried out research into suitable designs for schools in native townships and, as a result of the success of this work, requests have been made by several provincial administrations for similar work to be undertaken in respect of European schools.

At the request of the Transvaal Provincial Administration, the Institute has recently designed an experimental school to be built at Waterkloof, Pretoria. This design has been based on the research findings to date. The main aims have been to show by functional planning, such as the design of simplified foundations especially planned to fit the site, reducing unnecessary space, lowering of ceiling heights, and economical use of materials, that it is possible to reduce costs without in any way lowering the standards necessary for a teaching institution.

In fact, it has been found possible to increase some of the amenities usually provided for schools: artificial lighting has, for example, been provided in all classrooms. Tenders have been invited and it is hoped that construction will commence soon.

A detailed investigation of the factors that dictate ceiling heights in buildings was carried out. This is a matter of considerable economic importance, not only in the Union but elsewhere in Africa too. Furthermore, it is closely linked with lighting, ventilation and the thermal conditions in buildings and, as such, requires careful study. Recommendations have been drafted and will be published soon.

Symposium on Building Design

SOUTH AFRICA may be able to make a significant contribution to building design for African climates through a symposium to be held in Durban during October. Aim of the symposium, jointly sponsored by the Council for Scientific and Industrial Research and the University of Natal, will be to foster interest in the various aspects of building design in relation to life in the tropics and sub-tropics.

BOOKS RECEIVED

HOUSING IN GREAT BRITAIN. By Herbert Ashworth. (London: Thomas Skinner and Co. (Publishers), Ltd.) Price 7s. 6d.

WHILLANS'S TAX TABLES, 1957-58. (London: Butterworth and Co. (Publishers), Ltd.) Price 5s.

ANCIENT MONUMENTS BOARDS

Annual Reports

A STRONG recommendation that the Ministry of Works should seek guardianship of the entire remains of the Roman Wall, particularly the continuous 27 miles between Lanercost and Planetrees, is contained in the third annual report of the Ancient Monuments Board for England, which was published on July 16.* 'Among other advantages,' declares the report, 'the Wall would become the great national monument its importance warrants, and the labour force at the Ministry's disposal could be employed upon those parts in the greatest danger from decay. A more uniform method of preservation could be observed and the sites of the turrets and mile-castles marked by standard signs.'

As the report points out, 20 sections of the Wall and its associated forts, totalling 4¼ miles of wall, are already in the Ministry's care. Another 3½ miles are in the hands of the National Trust. The remainder, which includes some of the most important sections, is in private hands. All the remains of the Wall have been scheduled under the Ancient Monuments Acts, but this is purely protective and does not compel owners to maintain the sections of the Wall on their land.

The Board recognise that there are at the present time substantial practical difficulties in the way of increasing the Ministry's 'load of work' on the Wall. It is difficult enough to recruit and train sufficient numbers of men for the skilled work of preservation even of the relatively small amount of the Wall already in the Ministry's care. However, the Ministry will continue to accept guardianship offered by owners, and preservation will proceed as fast as available labour permits.

On treatment of the remains of the Wall, the Board agrees with the Ministry's method of consolidating the original masonry without any attempt at extensive rebuilding. But it considers that careful thought should be given to the appearance of the finished work and its setting against its natural background before each section of the Wall is treated.

Dealing with Stonehenge, the report makes it clear that, while approving the 1956 programme of limited digs 'to solve certain problems and to check obscurities,' the Board feel that the western half should be left for future excavation with more advanced techniques. The Board hope that their 1954 recommendation that the fallen trilithon should be re-erected will be put in hand as soon as possible. The planning of this operation has been proceeding.

The report announces that the Ministry has now completed the survey of monuments in Wiltshire. In the course of this survey, inspectors visited all the 300 scheduled monuments, barrows and groups of barrows in the country. They found that nine barrows had been completely destroyed and 61 barrows damaged. In addition, 340 monuments considered suitable for scheduling were visited, and of these 103 barrows had been damaged. 'The principal cause of this destruction and damage is ploughing of barrows and earthworks by modern methods, and the final figures emphasise the urgent need of remedial action.'

By the end of 1956, the report discloses, 5,676 monuments had been scheduled in England. The rate of scheduling in 1956 was a little slower than in the past, largely because more time was spent in consulting owners and occupiers.

Scotland

The Ancient Monuments Board for Scotland, in their report for 1956, welcome the assurance that before any further quarrying is allowed beyond the agreed limits at Traprain Law—'considered to be one of the most important archæological sites in the country'—the Ministry of Works will give the matter their most serious consideration and will not overlook any of the available remedies against further encroachment.

The Scottish Board were also disturbed to learn that mining developments in Fife were likely to lead to the extraction of coal from seams underlying Culross, an ancient burgh that has altered little since the 17th century. Declaring that the effects of mining subsidence in Culross would be 'calamitous,' the Board are grateful for the assurance that both the Ministry of Works and the National Trust will be consulted if the coal seams under the town prove to be workable.

During the past year Scottish excavation work has been concentrated in the Hebrides, notably in the area under consideration for use as part of a guided-missile range. Only ten monuments were recommended for scheduling in 1956, mainly because the Inspectorate of Ancient Monuments were tied up with the extensive operations in the Hebrides; and the total number of scheduled monuments in Scotland now stands at 1,981.

Wales

The Ancient Monuments Board for Wales welcome in their 1956 report the news that there is a possibility of solving by means of a one-way traffic scheme, without destruction of any of the 'incomparable' walls of Conway, the traffic difficulties associated with the Bangor Arch at Conway.

The Welsh Board are paying particular attention to the preservation of the large number of early Christian inscribed stones in Wales, and hope to complete their survey this year. Their policy is that stones of soft material should be removed to shelter and that durable stones should only be moved when it is necessary to avoid damage. The total number of scheduled monuments in Wales is now 1,776.

* Ancient Monuments Boards for England, Scotland and Wales, Third Annual Reports, 1956. Published by HMSO, July 16, 1957, price 1s. 6d.

TECHNICAL EDUCATION OVERSEAS

New Council Set Up

AS announced in answer to a question in the House of Commons on August 1, a new Council has come into being to replace the existing Advisory Committee on Colonial Colleges of Arts, Science and Technology (ACCCAST)—the Council for Overseas Colleges of Arts, Science and Technology (COCAST).

The creation of the Council reflects the need for widening the Committee's terms of reference: under its new constitution it will be able not only to serve the interests of technical institutes in the overseas territories, but also to continue to help in the development of similar colleges in the new self-governing countries of the Commonwealth, if they so desire.

Set up by the Secretary of State for the Colonies in 1949, ACCCAST has since fostered the development of the Royal Technical College of East Africa in Nairobi—which was officially opened by Princess Margaret last October—of the Nigerian College of Arts, Science and Technology with branches in the three regions of Nigeria, and of Kumasi College of Technology in Ghana. It has also assisted with the development of Fourah Bay College in Sierra Leone, and with the setting up of the Singapore Polytechnic, and is advising on the establishment of technical colleges in the West Indies.

As Advisory Committee on grants for higher technical education under the Colonial Development and Welfare Acts, ACCCAST has always worked in close contact with the Colonial Office The new Council will still be available for advice to the Secretary of State for the Colonies.

Chairman of the new Council is Sir David Lindsay Keir, Master of Balliol College, Oxford, who was chairman of ACCCAST. Its other 16 members, who were also formerly members, include prominent educationists with wide experience of education in the overseas territories and leading figures in the field of technical education in the UK. Provision has also been made for three co-opted members to be added to the Council. Payment for the Council's secretariat and overhead expenses is made largely from Colonial Development and Welfare funds.

Main function of COCAST is to advise the Secretaries of State for Commonwealth Relations and for the Colonies, overseas governments, governing councils of overseas colleges and other interested organisations on the development of colleges of Arts, Science and Technology. These are defined as colleges which offer courses of general scientific and technical education leading to professional or near-professional qualifications (not, normally, university degrees) and which encourage research—including colleges which offer, in addition, courses of a lower standard.

It will be ready to assist in the recruitment of staff, to advise on matters of academic policy, to stimulate the interest of technical and other institutions in the UK in the overseas colleges and to assist examining bodies and professional institutions in Britain on courses, examinations and qualifications specially designed to meet the needs of overseas students.

HOUSING PROGRESS REPORT

Figures for First Half of 1957

THE Housing Progress Reports presented to Parliament as White Papers* by the Minister o Housing and Local Government and the Secretary of State for Scotland show that the number of permanent houses completed in Great Britain during June was 25,251 compared with 27,772 in June, 1956. In the first six months of 1957, 152,405 permanent houses were completed compared with 144,412 in the same period of 1956. Detailed figures at the end of June were:

PERMANENT HOUSES AND FLATS COMPLETED

	Great Britain			England and Wales		
	Post-war total to June 30 1957	*Completions in June*	*Completions in 1957 to June 30*	*Post-war total to June 30 1957*	*Completions in June*	*Completions in 1957 to June 30*
By Public Authorities						
Local authorities†	1,917,965	14,036	85,922	1,643,759	11,340	71,280
Housing associations ...	41,028	166	1,191	39,745	129	1,140
Government departments	66,707	787	3,934	59,861	642	3,529
Total	2,025,700	14,989	91,047	1,743,365	12,111	75,949
By Private Builders ...	667,580	10,262	61,358	644,129	9,774	59,813
Total	2,693,280	25,251	152,405	2,387,494	21,885	135,762

PERMANENT HOUSES AND FLATS UNDER CONSTRUCTION

	Great Britain			England and Wales		
	Under construction at June 30 1957	*Under construction at Mar. 31 1957*	*Under construction at Dec. 31 1956*	*Under construction at June 30 1957*	*Under construction at Mar. 31 1957*	*Under construction at Dec. 31 1956*
By Public Authorities						
Local authorities†	160,468	161,164	170,548	128,540	128,927	137,147
Housing associations ...	1,235	1,636	1,780	1,164	1,533	1,665
Government departments	5,053	6,055	6,969	4,582	5,634	6,591
Total ...	166,756	168,855	179,297	134,286	136,094	145,403
By Private Builders ...	89,135	84,483	86,073	85,409	81,034	82,672
Total	255,891	253,338	265,370	219,695	217,128	228,075

CLEARANCE OF UNFIT AND OTHER HOUSES: ENGLAND AND WALES

	Second quarter, 1957	*First quarter, 1957*	1956	*Total since April 1, 1945*
Number of Houses:				
In clearance areas submitted	8,831	10,847	44,470	—
In clearance orders confirmed	3,089	2,341	6,658	20,453
In compulsory purchase orders confirmed	7,680	5,076	18,864	53,847
Demolished or closed	‡	10,375	34,852	167,264
Number of Persons:				
In clearance areas submitted	26,202	33,542	137,677	—
In clearance orders confirmed	7,884	6,104	18,133	56,437
In compulsory purchase orders confirmed	23,386	15,339	56,981	173,712
Moved from houses demolished or closed	‡	32,262	108,384	525,301

* Cmd. 233 Housing Return for England and Wales, June 30, 1957. HM Stationery Office, price 6d.; post free, 7½d.
* Cmd. 234 Housing Return for Scotland, June 30, 1957. HM Stationery Office, price 1s. Post free, 1s. 1½d.
† In Scotland includes houses built or being built by Scottish Special Housing Association.
‡ Not yet available.

IBICC ASSOCIATE EXAMINATION

Successful Candidates

OVER 350 candidates sat for the 1957 Associate Examination of the Incorporated British Institute of Certified Carpenters held recently at various centres throughout Britain. Prizewinners were as follows: First: Institute Medal and 6 gns.—J. Roberts, Dundee Trades College. Second: 5 gns.—J. Skinner, West Kent Tech. Coll. Third: 4 gns.—J. McKenzie, Gravesend Tech. Coll.

Preliminary awards of certificates and book prizes (value £2 2s.), judged by Section Officers, were awarded to:

Central Section.—R. A. Pipe, Building Crafts Training School. (Frame with pivot hung sash and splayed linings.)

North-Western Section.—R. Oakes, Crewe Tech. Coll. (Reading lectern in English oak.)

North-Eastern Section.—P. Bennett, Dewsbury and Batley Tech. Coll. (Niche in Tasmanian oak.)

Western Section.—Philip R. Dominey, Coll. of Tech., Bristol. (Handrail wreath.)

Midland Section.—J. Brooks, Coventry Tech. Coll. (Semi-circular headed splayed door lining.)

Scottish Section.—B. Roberts, Dundee Trades Coll. (Part of commemoration table in oak.)

Southern Section.—D. G. White, Portsmouth Coll. of Tech. (Altar Cross in oak and walnut.)

West Scottish Section.—J. B. Chalmers, School of Building, Cambuslang. (Model Pendentive Dome, all members laminated.)

Northern Section.—Harry Hill, Stockton Tech. Coll. (Segmental niche in mahogany.)

Premier Award of certificate, and book prize (value £3 3s.).—Judged by Prize Awards Committee, went to John Brooks, Coventry Tech. Coll.

EVERYDAY THINGS

XI.—Dixy Tea

By ARTHUR W. KENYON, CBE, FRIBA

I WONDER how many people today have ever heard of Dixy Tea, and how many have ever tasted it. It was a wonderful concoction, made in a dixy, which is a large iron pot with a handle to it and a lid. This pot was filled with water and brought to the boil over a wood fire which used to lick round the pot, and it therefore became rather smoky. A packet of tea was then emptied into the boiling water and stirred with a stick: a tin of condensed milk was poured in, and sugar added, with a little soda to bring out the flavour.

The dixy was taken round the job by the Tea Boy, and the men used to dip in their mugs, or they would come and fetch it as the case might be. It is just as essential to drink dixy tea out of a tin mug as it is to drink beer out of a tankard or wine out of a stemmed glass.

Anyone who has not tasted this beverage will be unable to appreciate the stimulating quality which it had, especially on a bitingly cold day. I always made a point of arriving on a job at dixy time, and I kept my tin mug on the site.

Well, of course, this has all gone. There is now a tea break morning and afternoon, when tea is procured from the canteen, and the architect has a cup brought to him, sometimes with a saucer. Likewise, the mid-day meal is now taken in the canteen which has become a necessity on any job.

I don't think, however, the canteen has really taken the place of either the dixy or the mid-day meal brought by the men from home. Some brought sandwiches and a bottle of cold tea, but the majority used to cook their own meal which they ate in groups of their own trade—bacon and eggs, sausage and mash, fried on improvised frying pans over a wood fire, or warmed-up stew, finished off with bread and cheese and billy-can tea. These were times when a good appetite was worth while.

Progress, however, has not allowed such primitive methods to continue, and the canteen has taken their place. But I would put in a plea for more efficient canteens than we frequently see on a job. If not, then please let me have my dixy tea in the open air.

(To be concluded)

INQUIRY BUREAU

Retention Fee Withheld

Q.—I recently took on sub-contract work for which estimates were submitted. After repeated requests for confirmation of these it was not forthcoming, nevertheless work was carried out for which I received payment less 5 per cent. retention for a period of three months. During this period I have not been requested to carry out any maintenance, so submitted account for retention due. I have been informed by the employer that he will not pay this sum as it has been expended on work. As I have received no order to carry out work is the employer in order to refuse to pay the retention held?

E. W. C.

A.—A legal correspondent writes: It is desirable to record the terms of a building contract in writing, but the absence of a formal document does not invalidate the contract. The only difficulty is that it may be necessary to call evidence as to what was agreed between the parties and that the Court may have to infer the terms of the contract from their conduct.

In this case it would seem to have been the intention that the builder should do the work in question for the price which he tendered subject to a retention of 5 per cent. for a period of three months. From the facts before me, I can see no justification for withholding the retention money any longer.

A. E. T.

Foundation Concreting

Q.—It is proposed to build a bungalow on clay subsoil. To avoid subsidence due to shrinkage, it is suggested that the footings be at 3 ft. 6 in. (or 3 ft.) depth and that the trenches be filled with concrete instead of using bricks, also that reinforcement in the form of two mild steel rods (⅜ in.) be placed 1 in. up from the bottom.

Is it correct to say that all this foundation concreting should be completed in *one* manoeuvre? If this is not essential, would you please indicate good building practice for doing the job otherwise than in one stage from start to finish?

Would you please explain the new term 'stabilised soil cement' for foundation work. Is this a process which may take the place of normal strip foundations as above and is its use applicable to the construction of single domestic dwellings?

H. J. D. Y.

A.—It is assumed that the site for the proposed bungalow is relatively level. The suggested foundation depth of 3 ft. 6 in. is quite in order. To fill the trench with concrete (35 to 40 cubic yards) would be more expensive than by using bricks. On the other hand, if the clay foundation is not uniform as regards bearing power, the solid concrete would span any weak pockets with less chance of fracturing in the event of uneven settlement. It is an unnecessary expense to reinforce the concrete if the foundation soil is good.

Assuming that the clay is uniform, I would suggest a concrete foundation of 1 foot thick, and twice the thickness of the wall although a 9 in. thickness will suffice if the clay is firm. It would be best to lay the concrete foundation in one operation but if this is not possible, then finish each section up to two stop boards to form a joint similar to a carpenter's halving joint.

Some reinforcing rods could be laid in the concrete joint to tie the new to the old concrete if the casting of the new concrete is likely to be delayed for some days. If such is the case, make sure when making the joint that the old concrete joint surfaces are cleaned with a wire brush and a ¼ in. to ⅜ in. rendering of cement mortar applied before placing the new section of concrete.

'Stabilised soil cement' is a term used in road construction. From 7 to 14 per cent. of Portland cement is added to the foundation soil, according to its composition, to form a dense soil cement base on which to cast the concrete road slabs.

This method of stabilising soil with cement could no doubt be used for foundations of dwellings built on a gravel soil, but the procedure used for road work would not be practicable for this kind of work, and the by-laws would not allow it.

R. M. E.

Suitable Laboratory Flooring

REFERRING to a reply on the above subject contained in the May 31 issue of *The Builder*, Semtex, Limited, Semtex House, NW9, write: Your correspondent 'H.O.D.' in reply to an inquiry concerning a suitable alternative to granolithic or quarry tiles in a metallurgical laboratory, confined his recommendation to acid resisting asphalt.

We feel that mention should have been made of other equally suitable floor coverings, which, in addition to possessing the necessary resistance to oil and acid spillage, are highly decorative. We refer particularly to the PVC ranges of floor coverings, and would confidently expect Semflex or Vinylex Tiles, not only to withstand the conditions to be found in such a laboratory, but also to enhance considerably its appearance.

APPEAL AGAINST LCC REQUIREMENTS

Question of Tribunal's Authority

AFTER hearing legal argument, the Tribunal of Appeal under the London Building Acts, sitting in London on August 2, decided it had no authority to hear an appeal by Hulton Press, Ltd., against the requirements of the LCC under the Restriction of Ribbon Development Act Entrance and Egress (London Order) 1936.

The London County Council had decided that the ramp from Fleet-street into the new Hulton building should be used as an entrance. Hulton Press, Ltd., wished to use it as an exit and their appeal was based on this ground.

For the LCC, MR. K. F. GOODFELLOW submitted that, under the regulations, Hultons were 'out of time' in that they should have given notice of appeal within 28 days of the Notice of Requirement of December 4, 1956.

This argument was resisted by MR. J. C. BURGE (for Hultons), who argued that the notice was delivered to the builder's agent and not to Hultons.

After consultation with his colleagues, the Tribunal President, Mr. N. H. Moller, OBE, upheld Mr. Goodfellow's submission.

MR. MOLLER said the Notice required under the regulations was written on December 4, and, as the appeal was not lodged within 28 days as required, the preliminary point would have to stand, as the Tribunal had no discretion to extend the time of appeal.

WHEN IS A DOOR A WINDOW ?

Dorking Magistrates' Decision

WHETHER a glazed casement door—known as a french window—is, legally, a window was a point the Dorking Justices were asked to consider on August 2. They decided, in effect, that a casement door is a window and Dorking Urban District Council, who were respondents in the case, have decided to appeal against the decision.

The case was brought before the Court by True Bond Homes, Ltd., who are engaged on private housing development at Goodwyns estate, Dorking. The Justices were told that, in May last, the Council's Planning Committee rejected plans for 12 semi-detached bungalows which the company proposed to build at Goodwyns. The Committee gave as their reason for rejection that the plans did not comply with the requirements of one of the Council's building by-laws. This states: 'Every habitable room shall be provided with a window or windows which shall be so constructed that a total area not less than one-twentieth of the floor area of the room may be opened to the external air.'

The plans for the Goodwyns bungalows provided window space comprising (1) top hung (openable) ventlights; (2) fixed non-openable lights; and (3) glazed casement doors. The area of the openable ventlights alone did not comply with the by-law requirement. The committee rejected the plans because, in their view, the casement doors were not windows within the by-law's meaning.

Appealing against that rejection, True Bond Homes, Ltd., were represented by MR. A. E. TELLING, and evidence on the company's behalf was given by MR. D. W. BUGBY, a chartered surveyor. These two contended that a casement door is a window in the ordinary sense of the word and it satisfied the purpose of the by-law in giving adequate light and ventilation. Replying for the Urban District Council, the deputy surveyor and the assistant solicitor contended that a casement door was intended primarily as a means of access rather than of ventilation. In other words, it is a door and not a window. They argued that the word 'window' should be constructed in its ordinary sense and with due regard to the purpose of the by-law. Ventilation needs were not likely to be served by a casement door which would not be used for that purpose except in the hottest weather.

The Justices, MR. H. M. GORDON CLARK and MR. D. C. POND, decided that the plans for window space did not contravene the by-law. Mr. Telling applied for 50 guineas costs to be paid by the Council. It was pointed out that the High Court had held that successful appellants against decisions by local authorities were entitled to their costs unless the Magistrates thought fit on proper grounds to withhold them. After hearing arguments from both sides the Justices made an order that the Council should pay 20 guineas costs.

BRITISH STANDARDS

Mastic Asphalt for Roofing (Natural Rock Asphalt Aggregate) (BS 1162 : 1957)

SINCE this British Standard was first published in 1944 on the basis of a specification prepared by the Natural Asphalte Mine-Owners' and Manufacturers' Council, there has been a good deal of progress in the methods of manufacturing and testing the materials concerned. The revised edition of the standard now published takes account of these advances and brings the definitions used into line with those in revisions of other British Standards for asphalt products. (Price 3s.).

Among the main changes, a maximum hardness number is now given in addition to the minimum previously laid down; and, in order to narrow the permitted limits of composition, separate analyses are specified for use with natural rock from Swiss sources and for rock from all other sources.

The standard is divided into four sections, the first of which is primarily concerned with definitions; the second gives required properties of the materials such as flux oil, natural rock asphalt, aggregate and two types of asphaltic cement; the third section deals with the manufacture of mastic asphalt blocks and the re-melting procedure on site; while the final section covers sampling and testing requirements.

Three appendices set out respectively the method of determining the acid solubility of coarse siliceous aggregates, the method of determining the hardness number, and recommendations for the application of mastic asphalt for roofing—the latter being based on British Standard Code of Practice CP. 114.201.

In connection with BS 1162 there is a 'certification mark' scheme, under which makers who agree to inspection and test by BSI may be licensed to use the Institution's 'Kite' mark. It is understood that members of the Natural Asphalte Mine-Owners' and Manufacturers' Council will, in fact, use the mark on their products as an independent guarantee of quality to users, who are recommended to look for the mark on their supplies of asphalt.

Cast-iron Spigot-and-Socket Soil, Waste and Ventilating Pipes (Sand-cast and Spun) Fittings and Accessories (BS416 : 1957)

THIS British Standard (price 7s. 6d.) has been revised mainly to incorporate requirements for spun pipes. Users of the standard will find that minor changes have been made to the dimensional table, that the text has been revised, and that all printed amendments to the 1944 edition have been embodied.

The scope of the publication is still confined to pipework for use above ground, for soil, waste and ventilating purposes. The grades specified are: medium, heavy and extra heavy—for manufacture by the sand cast process; and a medium grade, for manufacture by the spinning process.

The standard now includes a range of 3½ in. and 4 in. diameter fittings specially intended for use with single stack plumbing installations. Their purpose is to reduce the number of joints to a minimum and to provide automatic positioning of the branch pipes to ensure satisfactory functioning of the system according to the principles laid down by the Building Research Station and the Ministry of Works.

'Electric Lifts' Part 1: 1957 'General Requirements' (BS: 2655)

A 52-PAGE British Standard now published (price 7s. 6d.) provides detailed recommendations for the construction and safety of passenger, goods and service lifts. This comprehensive document is issued as BS 2655: Part 1. Dimensions for lift wells were recommended in Part 3 of this same standard, published two years ago; while Part 2, which is still to come, will be concerned with the special requirements applying to the most commonly used type of lift motor.

The early publication of Part I was called for by lift manufacturers and users, and in order to meet this demand the standard is issued in the form in which it was circulated to industry for comment. It is expected that a revised version will be published in the not too distant future to take into account any necessary amendments.

The standard makes detailed recommendations on every aspect of lift construction. Safety requirements, to prevent accidents to both passengers and maintenance workers, are a prominent feature. An extensive list of definitions is included to obviate misunderstandings between users and manufacturers.

Clinker Aggregates for Plain and Precast Concrete (BS 1165 : 1957)

THIS British Standard (price 3s.) has been revised in the light of present-day difficulties in the supply of clinker. It is still considered that, in view of the conditions of production and use of this type of aggregate, no specification or grading requirements of general applicability can usefully be included. It is, moreover, common practice for any grading and any crushing of oversize material to be carried out by the user after delivery; consequently the standard is limited to composition and soundness of clinker aggregates.

As now revised, it provides for three classes of clinker aggregate for use in different circumstances, but the limits for loss on ignition have been altered. The classes are set out as A1, A2 and B; clinker which was previously of Class B quality has been grouped with the original Class A, and is defined as Class A2, so that one main classification now covers all clinker suitable for plain concrete for general purposes and for *in-situ* concrete for interior work not exposed to damp conditions. The new Class B clinker with a new maximum combustible content of 25 per cent. covers the aggregate for all clinker concrete blocks.

Copies of these British Standards can be obtained from the British Standards Institution, Sales Branch, 2, Park-street, W1.

Lead Industry Integration

The Lead Development Association announce that the affairs of the Lead Sheet and Pipe Council have been integrated with those of the LDA with effect from July 1. The LDA has formed a Lead Sheet and Pipe section, on the committee of which members nominated by the Lead Sheet and Pipe Manufacturers' Federation will serve.

TIMBER FRAME HOUSES

LCC Experiment Under Way

BUILDING workers employed by Holland & Hannen and Cubitts, Ltd., at Farnham Royal, Bucks, have just begun the erection of timber framed terrace houses which are to form the subject of an experiment by the London County Council.

There will be five three-bedroom houses in the terrace, conforming in style and amenity with progressive post-war standards. Apart from the brick party walls and the end walls which will be faced with brick, the load bearing structure will be framed timber. The wood specified for the scheme is Pacific Coast Hemlock, surfaced to Canadian Lumber Standards.

In section, the exterior walls will consist of 2 x 4 nominal studding lined on the inside with insulation quality plasterboard and clad externally with Western Red Cedar boarding. Variation in external treatment will be achieved by using vertical Cedar boards up to the line of the ground floor windows and horizontal shiplap in the same timber for the remaining surface areas. Reliance on dry construction throughout is an essential part of the experiment.

As the LCC's investigation is concerned, in part, with building costs and methods, the framing up of the structure will be carried out on the site with the aid of ordinary carpenter's tools, but it is understood that major components will be crosscut to length by the contractors at their materials centre on the Farnham Royal Estate. Construction is expected to be rapid and although no hard and fast timetable has been arranged, it is probable that the houses will be completed more quickly than traditional dwellings.

This is not the LCC's first essay in timber building. In the 1920's, the Council put up between 300 and 400 all-timber houses. Maintenance costs over the years have been moderate and the houses are reported to be in excellent condition.

The Farnham Royal project is the outcome of an investigation started by the Council in 1955. It may be recalled that towards the end of that year, Mr. A. W. Cleeve Barr, Assistant Housing Architect of the LCC, went over to Canada to study modern methods of frame construction and, during his stay there, inspected building sites in Toronto, Ottawa and Vancouver.

The experiment is being conducted under the direction of Mr. D. Gazzard, of the LCC's research and development department. Mr. J. J. Ryan, a senior agent of Holland & Hannen and Cubitts, Ltd., who is responsible for the erection of the timber frame terrace, is at present supervising large scale developments for his company on the LCC estate. In December last year, Mr. Ryan visited Canada to familiarise himself with timber framing technique and dry wall construction, as practised by the Canadian building industry.

Sutton Trust Report

The Sutton Dwellings Trust have issued their 'Report and Accounts' for the year ended December 31, 1956, which includes lists of trustees and officers and a history of the Trust since it was founded in 1900.

CODES OF PRACTICE

BS Code of Practice for the Structural Use of Reinforced Concrete in Buildings (CP—114: 1957)

THIS revised edition of the Code (price 10s.) issued in 1948 deals with reinforced concrete design and construction as applied to beams, slabs, columns, flat slab construction and walls and bases in buildings. It also deals with floors, roofs and stairs, which were previously the subject of separate sub-codes.

The present edition incorporates some important changes and developments, which should lead to increased economy and freedom in design. The recommendations concern materials and strength requirements; also permissible stresses in steel and concrete, which have been increased wherever this could be done with safety.

The design of mixes to a specified strength requirement is now provided for, and for nominal mixes somewhat higher permissible stresses are allowed where the cube strength requirements for the particular mix are consistently exceeded.

Methods for assessing the bending moments and other stresses in the various members, and the permissible loads on columns, are included; and there are general formulae applicable to any type of steel.

Calculations for beams, slabs and eccentrically loaded columns on a load factor basis are now permitted. Recommendations are made on the practical aspects of concreting, formwork and the bending and placing of reinforcement.

Some guidance on the fire-resistance of certain types of reinforced concrete construction, based on the recommendations of the Joint Fire Research Organisation, is given in an appendix. The Code, which is illustrated, concludes with a comprehensive alphabetical index.

Copies of this Code may be obtained from the British Standards Institution, Sales Branch, 2, Park-street, W1.

DOMESTIC BOILER CHIMNEYS

Concern at Deterioration

SO CONCERNED are the master builders in Sutton, Epsom, Banstead and Wallington about the cause of cracking and crumbling of boiler chimneys in modern houses, writes a correspondent, that they called a special meeting recently at the Greyhound Hotel, Sutton, to discuss the problem. They invited a panel of experts from the Building Research Station, the Coal Utilisation Council, the Ministry of Fuel and Power, and boiler manufacturers to attend and give their views.

One builder said destruction of chimney stacks had become an increasingly serious matter. 'Two or three years after a house has been built, the chimney has to be repaired, and builders lose their reputation because the trouble recurs over and over again.' Banstead houses were particularly affected because most properties in Banstead had been built since 1920, when boilers were introduced.

MR. T. H. PAGE said in his opinion condensation was at the root of the trouble. This not only stained the interior walls, it also caused the chimney eventually to crack and crumble.

MR. C. J. ELDRIDGE, of the Building Research Station, said the trouble was extensive throughout Southern England and the Midlands. The only real answer was prevention. Moisture should not be allowed to form on the walls. This could be caused by householders using wet or damp fuel or drying clothes in the kitchen. One householder, he found, burnt wet potato peelings and tea leaves on the boiler fire.

MR. MOSS, of the Coal Utilisation Council, suggested several methods of prevention, such as lining the inside of the chimney; fitting a salt-glazed pipe inside the chimney; and the introduction of extra air at the foot of the chimney.

OBITUARY

Thomas Thorpe, FRIBA

MR. THOMAS HARRISON THORPE, FRIBA, died at his home in Farley-road, Derby, on August 5 at the age of 85. He had been an architect in Derby for over 50 years.

Mr. Thorpe was a former treasurer of Derbyshire Archæological Society and was for many years chairman of Derby Art Gallery Sub-Committee and a Borough Magistrate.

OFFICIAL NOTIFICATION

Disposal of Government Stocks of Zinc

THE Board of Trade announced on December 7, 1956, that they were about to make arrangements for reducing their stocks of zinc. They have decided to sell about 27,000 tons of zinc in a period of not less than nine months beginning September 1957. The first sales will be of about 9,000 tons for delivery and pricing over the three months September to November.

The disposal of the remaining 18,000 tons in two or more subsequent three-monthly periods will be the subject of further announcements from time to time.

Of the 27,000 tons, about 9,500 tons will be offered for sale by open competitive tender. The tender for the three months September to November will be for 3,200 tons.

The remaining 17,500 tons will be offered to the original suppliers or their agents.

THE EASTERN FEDERATION

Accident Prevention One-day Courses

ARRANGEMENTS have now been completed by the Eastern Federation of Building Trades Employers for a series of four one-day courses on accident prevention in some of the main centres in the Eastern Counties.

The courses will be held at: Luton, October 23, George Hotel; Chelmsford, October 28, Mid-Essex Technical College; Ipswich, October 29, Crown and Anchor Hotel; Norwich, December 2, Samson and Hercules House.

These one-day courses are intended to instruct on the Building Regulations and to stimulate greater interest in industrial safety leading to a reduction of accidents on building sites. The courses are open to the staff of member firms engaged in a supervisory capacity. Details from the EFBTE, 95, Tenison-road, Cambridge.

ACCIDENT PREVENTION MEMORANDUM

Conclusions Drawn from LMBA Conference

MR. COLIN A. SAMUELS, managing director of C.A.S. (Industrial Developments), Ltd., has put forward several conclusions on accident prevention in a memorandum presented recently at one of the company's foremen's meetings. Mr. Samuels produced his memorandum following the LMBA Accident Prevention Conference held in London on May 3, a report on which appeared in *The Builder* of May 10.

Stressing what he considers the most important issues in the prevention of accidents, Mr. Samuel stated: 'Departmental managers must see that every site is accident prevention conscious and that the regulations which are imposed to avoid accidents are rigorously applied. Agents, general foremen, foremen and chargehands must be physically responsible for seeing that safety regulations are observed and for constantly being on the alert to see that site personnel themselves are accident prevention conscious.

'Agents have authority to get the various accident prevention films down to site and to show them at any number of times they so desire, according to the length of time the contract has to run, and the number of different personnel on site.

'The better the housekeeping on a site, the less the risk of accidents. Included in good housekeeping, we want a clean tidy site as free from debris as is possible, so that if there must be traps at least those traps can be seen. Remember, a brick does not fall on a man's head from a scaffolding if it isn't there accidentally to be kicked over by somebody working on that scaffolding—and the same goes for any debris or tools which might be left lying around on the scaffolding.

'Craftsmen and labourers themselves can probably contribute more than the rest of us put together; don't take anything for granted. The man in charge of the job cannot be absolutely certain of every single item everywhere on the site—it just is not humanly possible. So just check that scaffolding before you go on it—see that the ladder which you are going to use for the next two or three days is properly lashed at the top; see that there is a safety bar across any lift well or any opening which must be left open for some little time and ask for one to be put there if there is not one. Bash that nail down before you throw a piece of timber on the floor where it can land with a nail sticking up, a deadly trap for the next man to walk on; throw *nothing* from your staging until you are absolutely certain there is nobody underneath; make sure when you put your tools down nobody can kick them off the staging or rip a foot open by treading on them.

'And finally—just remember this. However good a man may be at his job whether it is on the tools or supervising somebody else, this company has no use whatsoever for the man who takes risks with the lives and limbs of other men whatever the reason, whatever the cost, whatever the job.'

Incentives in the Building Industry

Part I—Types of Incentive Scheme in Use

By ALISON ENTWISTLE, BSc., and W. J. REINERS, BSc.

The following paper, which is Crown Copyright Reserved, deals with work forming part of the programme of the Building Research Board and appears by permission of the Director of Building Research. A fuller account of the work will be published shortly by Her Majesty's Stationery Office as a National Building Study.

Introduction

A STUDY of incentive schemes in building has recently been carried out with the aim of determining the factors contributing to the successful operation of incentive schemes at the present time. The investigation was made with the assistance of Conditional Aid Funds. At the outset of the study it was evident that the vital factors influencing success arise as much from the methods of operation of the scheme as from its form; a typical problem was that of a builder finding it difficult to operate, in practice, what was basically a well-designed scheme. The results from this study, therefore, have two main aspects, the first dealing with the details of a good incentive scheme, and the second with the principles necessary for the administration and operation of the scheme in relation to the firm as a whole.

Method of Inquiry

In order to put incentives into perspective it was necessary to consider the schemes in relation to the builder's organisation as a whole, and in particular to consider individual problems of operation. Detailed study of a few firms, rather than a survey of a large number, was clearly the best means of obtaining information of value to the industry. Nevertheless, it was necessary to cover a sufficient variety of experience to enable the underlying principles to be distinguished, and it was considered that a study of about 25 firms would satisfy this aim. To avoid the possibility of obtaining conclusions specific to the practice of a limited area, the firms were selected from different regions: seven in the North, six in the Midlands and eleven in the South including London. Seven of the firms employed more than 500 operatives, ten employed 100 to 500 and five employed less than 100. Two local authority direct labour schemes were included.

The information was collected by a team of two officers who spent about a week with each firm. The major part of this time was spent in discussion of the day-to-day running of the scheme with the site staff and junior members of the office staff, while policy decisions and the historical development of the scheme were discussed with the directors and senior staff.

For each firm, performance data were extracted from the records of recent contracts. Where possible, a housing contract was taken for this purpose but where this was not possible or was not typical of the particular incentive scheme, other types of work were studied. In any case information was sought on the operation of the scheme on non-housing work.

The bonus records varied greatly in complexity and completeness, but in general they yielded sufficient information on the cost and bonus payments made. Figures were obtained where possible on the gang constitution and the work content of operations. Ready access was given by builders to records of production and targets used, so that it was possible to gauge the success of the scheme in relation to actual productivity.

Proportion of Saving Paid as Bonus

The schemes included in the study were mainly based on the payment, as bonus to the operatives, of the whole or a part of the saving achieved on a predetermined target for a specified quantity of work. (It must be remembered that, in this context, 'target' and ' saving ' do not, in general, correspond to the expected cost of the job or the nett saving to the contractor, but are specialised terms used within the bonus scheme.) The majority of the firms visited preferred to retain some of the saving, as shown in Table 1.

Table 1

Percentage of Saving Paid as Bonus

Percentage paid	50–60	60–70	70–80	100
Number of firms	4	8	3	6

A common reason given by builders for withholding a part of the saving was that the proportion retained covered the cost of administration of the scheme and paid for any losses without making separate allowance for these. On the other hand, if desired, an allowance for overhead costs can be made in setting the targets, whatever the percentage paid, so that the cost of the scheme, a constant figure, can be accounted for by an amount fixed at the outset rather than by a saving which varies with productivity.

A more important point made by a few builders was that a lower bonus rate enabled easier targets to be set with the same expectation of bonus earnings, thus giving slower workers a chance to qualify for bonus without attaining the performance required by 100 per cent payment. Most builders agreed, however, that 100 per cent payment was a greater inducement to labour in the first instance. Six builders had on occasion increased the percentage normally paid to the operatives purely in order to counteract the labour shortage. In three of the cases this change was to conform to local practice for fear of losing men to other firms; in some cases the operatives had demanded 100 per cent payment before accepting the job.

Firms consistently paying all the saving as bonus claimed that the 100 per cent payment was a greater incentive to the operatives who definitely preferred this method and so worked better. This system also appealed to the builder because of its simplicity and convenience. For this reason smaller builders tended to favour the 100 per cent payment while large firms considered some retention necessary to offset the additional administrative expenses incurred by their more complex organisation. Some firms said that their chief aim was to keep costs within the estimate and, provided no losses were incurred, more definite forecasts of labour costs could be made when making a 100 per cent payment.

In four firms, bonus was paid at a definite rate (e.g. 2s. 6d.) per hour saved. This helped to stress that bonus was a reward for good performance, and not a rightful addition to the wage rate of which part was being withheld by the employer. In addition, this system provided that wage increases, which were recoverable by the contractor, did not automatically add to the bonus cost.

There was no direct connection between the percentage of saving paid, and the productivity levels in the firms studied, but labour relations were generally better where a higher percentage was paid and good labour relations were definitely associated with higher productivity. However, in some firms, in which special efforts had been made to explain the basis of the scheme, the smaller percentage had been accepted by the operatives. Where such explanation can be given, the lower percentage does in fact have some advantage for the operatives, provided the targets are adjusted to give the same average expectation of bonus earnings, since it smooths out irregularities in bonus. Economically it is certainly an advantage to the builder to retain part of the saving since, although the target is adjusted, the variation caused by unbalanced targets on different operations is reduced, and less additional payment is incurred on excessively easy targets. In areas where the practice of a 100 per cent payment has already been established, however, adoption of the same system will clearly give the better results.

Form of Target Unit

Two main types of scheme can be distinguished: those based on targets for 'bonus operations' and those using 'unit rates' applied to measured work.

In the first method, the work within a trade is divided into suitable operations, a target is set for each and the bonus assessed on completion of the operation by comparing the actual cost, whether in hours or wages, with the target cost. The bonus paid is a proportion of the resulting saving. In a modification of this method, bonus is assessed on a weekly target of all operations or parts of operations done in the week.

The second method uses targets in the form of unit rates. The work done is measured at regular intervals, normally every week, and the respective target unit rates are applied to each item of work to give a value for the work done as a weekly target. This is then compared with the

labour costs for the week and again a proportion of the saving is paid as bonus.

The essential distinction between these two methods is that the first uses predetermined targets for bonus operations, while the second involves regular measurement of work in order to apply the unit rates as the job proceeds.

The application of these two methods to different types of work is shown in Table 2 in which 'Flats' includes three- to five-storey blocks and a block of shops with maisonettes above, while 'Other Work' includes a school, a factory, a large store with offices and a block of shops.

Table 2

Application of Target Systems by Type of Work

	Operation Targets	Unit Rates
Housing...	14	0
Flats	1	4
Other Work	0	4

With an operation target system, preparatory work is necessary to determine targets before the start of the job. In one small firm this was found to be impossible because of overloading of the administrative staff. The result was that the operatives did not know their targets until several houses had been completed and this led to suspicion and dissatisfaction.

Where unit rates are employed, no preparatory work is needed except where the rates normally used need to be adjusted to suit particular conditions. However, regular measurement during the progress of the work constitutes a very onerous task especially if this is done additionally to measurement for interim certificates.

The system of operation targets is preferable to unit rates wherever its application is practicable because:—

(*a*) It is simple and straightforward in application. Operations require only visual assessment and bonus can readily be calculated.

(*b*) The scheme is more economical to run as it requires a minimum of time and skill from bonus staff.

(*c*) The scheme can provide valuable cost information at operation level and form the basis of cost control.

(*d*) Operation targets are simple for the operatives to appreciate.

The difficulty of applying an operations system to non-housing work was stressed by all builders, although one had applied this system to flats. In this firm a detailed costing and cost control system was employed at operation level and most of the work was split into units of one flat. The success of this method demonstrated the possibility of devising operation targets in flat construction at least for the finishing trades where the repetitive unit of one flat is a natural basis.

It would seem that even on non-repetitive work where the work has been planned in some detail, the programmed weekly stages of work should provide a basis for definite targets in each trade. However, the opportunity of using this basis for a target system was not taken by any of the firms visited and a comparison of the economic advantages of the two methods cannot be made in this study.

Where the method of target operations is used and bonus is assessed on completion, the saving or loss on each operation stands on its own and it is generally accepted that losses on one operation cannot be offset by the gains on another. Where the work done on several operations is combined to give a weekly target, individual gains or losses may be evened out in the calculations and result in a more economical system. In the example in Table 3, four operations by the carpenters contributed to one week's work for the gang. The bonus was calculated on the whole week's work giving an equivalent of eight hours' bonus, whereas payment on completion of individual operations would have resulted in 28 hours' bonus, owing to the fact that basic wages would have been paid on the two operations showing a loss on target.

Table 3

Operation (Carpenter)	Cost in Manhours	Target in Manhours	Saving in Manhours
Joists ...	21	28	7
Roof ...	39	60	21
First fixing	96	80	−16
Second fixing	90	86	− 4
Total ...	246	254	8

Although the grouping of operations results in economies in bonus on unbalanced targets, it does not provide records of the costs of individual operations which would otherwise be available as a basis for the improvement of the targets.

Size of Target Operations

In determining appropriate operations for use in a bonus scheme the following criteria are generally accepted:—

(*a*) Operations should be complete stages of work which require no measuring but can be visually assessed.

(*b*) Operations should be of about one week's duration with an upper limit of three weeks. Stages longer than this may be split further on the site into convenient sections.

(*c*) Work should be divided into 'straight' jobs where there are no hold-ups for other trades which may cause friction between them.

The division of work into operations in housing appears to follow a regular pattern dictated by the natural stages of work. For example, brickwork is normally divided into 'damp-proof course to first floor level'; 'first floor to wall-plate'; 'topping out,' and either one or two operations for internal partitions and finishings.

Such divisions conform to the criteria mentioned, but the importance of choosing operations of a suitable size is also dependent on the need for good site organisation to ensure that a gang is kept working on one operation until it is completed. In several firms, operations which normally should have taken not more than two weeks to complete went on for two or three months by which time all incentive was lost. Best results should be obtained where the operative can see a clear connection between the work he does and the bonus he earns.

Hours or Cost Targets

A minor point affecting bonus calculations in both unit rate and operation systems is the form of target, that is, whether the target is expressed in hours or cost. Each method was used by roughly the same number of firms in the study and the choice largely depends on individual preference. An advantage of the target in hours is that it is independent of wage changes for which adjustment needs to be made to cost targets, and provides data in a basic form for comparative purposes. The cost target is sometimes preferred as it automatically allows for the relative proportion of hours worked by skilled and unskilled labour.

There is no system which is universally preferred by the operatives on the site. Many of them tend to think of the target in terms of gang time and find a target in hours simpler to relate to this. However, others find a cost target easier to understand, particularly when there is payment of 100 per cent of the saving on target.

Distribution of Bonus

The share of bonus due to each member of a gang was invariably worked out in proportion to the hours worked by each man. In the majority of cases it was also calculated in proportion to the wage rate, so that either a definite share per hour was allotted to each operative based on his wage rate or the bonus was divided in proportion to the actual wages of each man.

About one-third of the builders felt that the sharing of the bonus should be decided by the operatives themselves and, of these, practically all paid equal shares per hour for craftsmen and labourers. The reasons given for this were that the productivity of the gang depended upon each member and that better work was produced by sharing the bonus equally among them. In addition many operatives felt that bonus should be outside the wages system and be a reward for effort rather than for skill.

Trade foremen were generally paid bonus on productive work at the same, or a slightly higher, rate than craftsmen and in addition an allowance for supervisory time was generally given.

Performance and Operation of Schemes

Most of the firms visited introduced incentives during the few years following the end of the war. It was, in most cases, an attempt to raise the level of productivity and in some cases was a continuation of the war-time Payment by Results Scheme.

The general attitude to the present-day situation was, primarily, that some form of additional payment was essential in order to obtain sufficient labour of the right type. Since this was so it was generally considered desirable to relate additional payments to output through a target bonus scheme. Most builders claimed that productivity had increased with the introduction of incentive schemes although evidence could not be given that present-day production was higher than it would be in the absence of incentives.

Table 4 shows the average bonus expressed as a percentage of the basic

Table 4
Bonus Paid as Percentage of Basic Wages

	Operation targets (assessed on completion)		Operation targets (assessed weekly)		Unit rates (measured weekly)	
	Average	Range	Average	Range	Average	Range
Bricklayer	35	14 to 49	44	14 to 90	27	6 to 68
Carpenter	36	5 to 54	27	11 to 48	23	7 to 44
Plumber	42	5 to 94	17	12 to 25	13	(one case only)
Plasterer	49	28 to 57	24	17 to 31	—	—
Painter	14	8 to 22	9	6 to 12	16	8 to 33

wage paid to each trade on the various types of scheme employed. In general a substantial improvement on target output was attained and this is reflected in an overall average payment of about 30 per cent in addition to the basic wage. Differences between trades were not consistent, depending to some extent on the local labour supply, but painters were generally paid less bonus than the other trades. In general it appeared that schemes based on both operation targets and on unit rates led to similar bonus earnings but a direct comparision cannot be made on this basis since the latter system was only employed on non-repetitive work. The data for operation target schemes were obtained from housing work only.

Bonus payments varied widely in level from firm to firm, ranging from 5 per cent paid in one firm to carpenters, and in another to plumbers, to 94 per cent paid to plumbers in a third. Within a given firm, payment to the various trades was more consistent so that each trade on the same site tended to have a similar bonus payment although there were exceptions.

A major problem associated with the high variability in performance is that of possible 'losses' which in this context is used to distinguish the case where the basic wage cost of the hours actually worked exceeds the target cost resulting in payment in excess of the predicted amount for one operation or week's work. Seven out of the 13 firms using targets assessed weekly had, on at least one occasion, recorded 'losses' on a week's work. Three out of the eight firms using operation targets had recorded overall losses on at least one operation and others had recorded losses on individual houses on particular operations. Such losses may arise from a lack of balance in the targets set or from uneven rates of working. They are normally not recoverable by reducing payment on subsequent work and therefore tend to increase the gross labour payment and to destroy the basis of cost control.

Because of such losses on some targets the overall bonus actually paid was in most cases slightly higher than the bonus strictly due to the operatives as shown by the bonus entitlement in Table 5.

Table 5
Bonus Entitlement as Percentage of Basic Wage

	Operation targets (assessed on completion)		Operation targets (assessed weekly)		Unit rates (measured weekly)	
	Average	Range	Average	Range	Average	Range
Bricklayer	34	16 to 68	42	−4 to 90	22	−2 to 63
Carpenter	34	−6 to 68	22	−8 to 48	24	2 to 49
Plumber	41	0 to 93	17	11 to 28	11	(one case only)
Plasterer	49	30 to 73	24	15 to 32	—	—
Painter	15	11 to 22	8	4 to 12	16	8 to 33

The general picture does not reflect the situation in individual firms, however, where the effects were sometimes more serious. In some cases, although losses were consistently recorded on targets, a positive amount of bonus was in fact paid to bring payment up to the general site level. Table 6 gives examples of such payments in three different firms. All figures have been expressed as a percentage of the basic wage cost of the time actually worked.

Table 6
Examples of Payment

Firm	Trade	Basic Wage Cost	Target	Loss	Bonus actually paid	Wage cost additional to target
1	Bricklayer	100	98	2	16	18
2	Carpenter	100	94	6	5	11
3	Bricklayer	100	94	6	14	20
	Carpenter	100	92	8	11	19

In the first two firms extra bonus was paid in order to retain the operatives. In the third firm the bonus actually paid represents an amount guaranteed at the start of the job in order to attract labour, but which had reduced the incentive so that in fact, a loss was incurred.

There was often, within the same trade in a firm, a high degree of variation in performance reflecting a general lack of consistency in target setting. For example, in one firm, there was a saving of 31 per cent. of the basic wage cost on the carpenters' work on the roof but a loss of 19 per cent. of the basic wage cost on first fixings.

In considering the variability of performance between firms a study was made of the relationship between the level of target and productivity achieved. Targets could be directly compared for brickwork since these were normally based on an overall rate; they varied from 21 to 48 bricks per man-hour. It was found that, over all the firms visited, those with high productivity employed the higher target rates while the lower productivity firms generally had easier targets. It cannot, of course, be inferred that productivity on any particular site could be improved merely by raising the target levels since the targets adopted are influenced by many other factors including local conditions and levels of productivity. What is important is the need for flexibility in considering local productivity levels in setting targets for jobs; this applies particularly to large firms operating in several areas.

Quality of Work

In a survey of productivity in housbuilding,* which covered the time of the general introduction of incentive schemes, the question of quality of work was investigated and no evidence was found that incentives were associated with poor quality generally. It seemed more probable that the quality of work depended mainly on the builder's organisation and methods. However, since the problem of workmanship is particularly relevant to incentive schemes the question was again investigated in the light of present-day experience.

The opinion generally held to-day with regard to quality is that any incentives to greater production automatically tend to result in lowered standards of workmanship. Of the 21 contractors visited, 17 stated either that the operation of a bonus scheme had had an adverse effect on quality or that it would have done so had they not taken steps to counteract this tendency.

It is likely that special attention must be given to supervision of quality with incentive schemes and this is particularly important where a large proportion of casual operatives is employed. The need to improve supervision of quality should not of necessity involve the cost of extra staff, since an incentive scheme generally reduces the need for supervision to reduce unproductive time. In nearly all cases this change in emphasis in supervisory responsibility from quantity to quality was pointed out by the general foreman on the site.

To encourage proper quality, 16 builders paid no bonus on any repeat work that arose from bad workmanship and four builders made the men pay for the job. A major difficulty in such cases is tracing the men or gang responsible because faulty work is often not discovered until the men have left the firm.

In one case the general foreman arranged that one gang completed the whole trade's work to one house. This eased the problem of tracing faulty work to its source and considerably helped the relations between gangs. However, where competition for labour was keen, it was often difficult to carry out these measures. In a few cases it was found that although it was the policy of the firm not to bonus repeat work, the site staff in charge of the job frequently did not carry this out for fear of losing the men concerned.

* 'Productivity in House Building.' National Building Studies Special Report No. 18, HMSO, 1950

Other devices for improving quality included a definite 'handover' bonus which was paid on completion of a house or large section of the work, provided that the standard of work had been satisfactory throughout. This again requires strict adherence to the principle to be effective, and in some cases it was found to have degenerated into a routine extra payment because of the fear of losing operatives should any money be withheld.

In some firms, targets had been given to include making-good operations for which some money was held back.

A principle observed by most builders was the necessity of making site staff who were responsible for quality independent of the bonus scheme. Some firms went so far as to exclude trade foremen from production bonus but this did not prove to be successful.

All the above measures, however, were successful in emphasising to the men the importance of good workmanship. Whatever measures are adopted it is necessary to stress the importance of this aspect and to ensure that the natural desire for good craftsmanship is not overshadowed by the effort towards greater productivity.

The Operation of Incentive Schemes

The more general problems of the relation of the incentive scheme to the management of the firm is the subject of the second part of this report which is to be published in next week's issue.—EDITOR.

The Cleaning of Stonework

SOME VALUABLE INFORMATION

A VALUABLE symposium of information on recent experience of washing the stonework of ancient buildings, collected at the instigation of The Cathedrals Advisory Committee for England, is given in the April number of the useful publication *Studies in Conservation*, the journal of the International Institute for the Conservation of Museum Objects. The material, which is introduced by the Editor, Mr. F. I. G. Rawlins, MSc, FSA, FRSE, Scientific Adviser to the National Gallery, London, Technical Director of the Central Council for the Care of Churches, and member of the Cathedrals Advisory Committee, relates to Bath Abbey, Exeter Cathedral, Gloucester Shire Hall, St. John's College, Oxford, Lincoln Cathedral, Romsey Abbey, St. Cross (Winchester), Wells Cathedral, and Westminster Abbey.

Although a good deal of cleaning of stonework by washing has been done in recent years, no attempt has been made hitherto to collate the results. Mr. Rawlins contributes only a short introduction to these reports, leaving the reader to draw his own conclusions which, on the evidence offered, can hardly be anything but favourable to the method. No attempt is made to cover the ground included in the digests of the Building Research Station (Nos. 20 and 21, 1950), dealing with the weathering, preservation and maintenance of natural stone masonry which, as the author says, contain a mine of information, both theoretical and practical, and should always be consulted since they describe in detail many of the causes of deterioration. Here the concern is solely with actual cases of washing, which have been done either by the staffs of the buildings concerned or by reputable firms with special experience of such work, who will undertake not to use caustic soda, soda ash, or any other deleterious preparation.

The reports on Exeter, Lincoln, Romsey, Wells, and Westminster Abbey are all accompanied by excellent photographic illustrations of work done. At Exeter, for example, the centre portion of the screen to the west front has been cleaned by a gentle water spray applied through a hose. Extensive traces of red paint on both the sculptures and the architectural framework were found, leading to the theory that the whole west front was originally painted in naturalistic colours. At Lincoln much effective cleaning has been done, notably in St. Edward's Chapel and the cloisters, by means of a system of compressed air-and-water mains into which an air-and-water nozzle can be connected at convenient points. At Romsey the early Norman Road has been cleaned by water applied in a spray at mains pressure. At Wells, the mainly early English north porch has been freed of heavy black deposits and lichen by means of sprays with ordinary adjustable garden-hose nozzles supplied from a hydrant. At Westminster Abbey, where atmospheric pollution has caused much damage to the stonework, particularly that of the cloisters, a nebulous spray has been employed with very satisfactory results. Internally, the remarkable effectiveness of the work done is conveyed by a splendid photograph showing the contrast between the brightness of the washed vaulting and walls of the presbytery and the darkness of the unwashed nave. Here, owing to the difficulty of water disposal, the cleaning is being carried out by hand.

In all the other cases described the cleaning by water has also been quite satisfactory. At Bath Abbey, the stone is exposed to a fine spray of water from a series of nozzles attached to a length of pipe connected to the main and moved up and down as required; at St. Cross Church water was applied in a spray at mains pressure and a soft brush used; at St. John's College the four sides of Canterbury Quad were cleaned of atmospheric pollution by fine water spray through a stirrup pump type of nozzle; while at the Shire Hall, Gloucester, the whole elevation has been cleaned down by a misty spray applied through hoses and nozzles and scrubbed with fine wire brushes and Hollington stone rubbers. It is particularly stressed by Mr. Rawlins and in the reports that washing should never be undertaken while there is any expectation of frost.

We understand that a limited number of copies of *Studies in Conservation* (which contains other articles of interest on the conservation and restoration of works of art) may be purchased from the International Institute, c/o The National Gallery, Trafalgar-square, London, price one guinea each. We understand also that reprints of the symposium with its illustrations will be available in a few weeks' time, price 2s. 6d. (by post 2s. 9d.), from The Cathedral Advisory Committee, Fulham Palace, SW6. The full information given, from which only a few facts are here extracted, should be of great value and interest to all who are entrusted with the care of ancient buildings.

G. J. HOWLING.

Work in Compressed Air

PROPOSED NEW SPECIAL REGULATIONS

MR. IAIN MACLEOD, Minister of Labour and National Service, published on August 2 Statutory Draft Regulations* under the Factories Acts which require special measures to be taken to protect the health and safety of men employed on work in compressed air.

The publication of the Statutory Draft provides an opportunity for organisations and individuals concerned to consider the requirements and to raise any points they may have with the Ministry. Representations should be addressed to the Secretary, Ministry of Labour and National Service, 8, St. James's-square, SW1, and must be received not later than August 29.

The Dangers of Work in Compressed Air.—The dangers for workers in compressed air, states the Ministry, arise chiefly as a result of rapid decompression; work in compressed air is not in itself dangerous but decompression is always a hazardous operation and must be carefully carried out.

'Caisson Disease,' usually known as 'the bends,' is the most common illness arising from incorrectly controlled decompression. This condition is due to the release during decompression of gases, mainly nitrogen, which have been driven into solution in the blood and tissues during work under increased air pressure. The nitrogen forms bubbles in various part of the body which, depending upon their size and location, may cause severe pain, loss of consciousness, and even permanent disability or death.

What the Draft Regulations Provide.—The new Regulations are designed to ensure that close attention is paid to the health and safety of those working in compressed air and, in particular, that correct control and supervision is exercised over procedures, both in compression and decompression. Detailed rules for these procedures are contained in a schedule to the Regulations.

*The Work in Compressed Air Special Regulations, 1957, obtainable from HMSO or through any bookseller, price 8d.

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

	£ s. d.
Pit Ballast ... ... per yd.	1 7 1
Pit Sand ... ... ,,	1 4 6
Washed Sand ... ... ,,	1 7 8
¾ in. Shingle ... ... ,,	1 4 0
¼ in. Broken Brick ... ... ,,	1 0 9
Pan Breeze ... ... ,,	10 9
Fine or Coarse Foamed Slag Aggregate ... ... per ton	3 5 0
2 yds. of fine and 2.6 yds. of coarse per ton.	

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

Best British Portland Cement. Standard Specification delivered Charing Cross area.	
6-ton loads and upwards, site ... ... per ton	5 12 0
1 to 6 tons, site ... ... ,,	6 4 0
Rapid Hardening Cement in 6-ton loads and upwards to site ... ... ,,	6 2 6
1 to 6 tons do. site ... ... ,,	6 14 6
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.	
Sulphate Resisting Cement. 32s. 6d. per ton on ordinary cement prices.	
Red, Buff or Khaki Colorcrete in 6-ton lots ... ,,	8 12 0
Other colours according to colour.	
In 4-ton lots from 310s. 0d. to 780s. 0d. per ton.	
White Portland Cement ... ... ,,	13 17 6
Under 1 ton ... ... per cwt.	16 11
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards ... ... per ton	7 4 6
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.	
Cullamix Tyrolean Finish, £11 10s. 0d. to £14 5s. 0d. (1-ton loads and upwards).	
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up ... ... ,,	15 14 6
Stourbridge Fireclay, 6-ton loads at Railway Depot, London ... ... ,,	6 17 6
Moler Mortar Powder for Flue Bricks (London sites) ... ... per cwt.	1 11 0

BRICKS

Full Loads.	
First Hard Stocks ... ... per 1,000	13 14 6
Second Hard Stocks ... ... ,,	12 13 6
Mild Stocks (Kiln Burnt) ... ... ,,	9 4 0
Mild Stocks ... ... ,,	8 19 0
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.	
2½in. Nominal Fletton Bricks to sites in W.C. District Commons ... ... ,,	5 18 0
Cellular do. ... ... ,,	5 18 0
Keyed do. ... ... ,,	6 0 0
Rustics ... ... ,,	7 10 0
Cellular Rustics ... ... ,,	7 10 0
Single Bullnose Commons ... ... ,,	7 12 6
Sandfaced ... ... ,,	8 10 0
Tuscans ... ... ,,	9 5 0
Saxons ... ... ,,	9 13 0
Golden Buffs ... ... ,,	10 0 0
Dapple Light ... ... ,,	10 7 6
Best Blue Pressed Staffs (London Stations) ... ,,	29 15 6
,, Bullnose (London Stations) ... ... ,,	30 9 6
Blue Wire Cuts (London Stations) ... ... ,,	26 15 6
Midhurst Lime Bricks (London sites) ... ... ,,	10 15 6
Uxbridge Whites (London sites) ... ... ,,	10 2 0
Special Purpose Sandlime Bricks (London sites) ... ,,	7 18 6
2½ in. Best Stourbridge Fire Bricks (London Stations) ... ... ,,	29 9 9
3 in. do. (London Stations) ... ... ,,	35 7 9
2¾ in. Moler Flue Bricks (London sites) ... ... ,,	37 10 0
2⅝ in. Machine-made Sandfaced Red Facings (London sites) ... ... ,,	15 18 6
2⅝ in. Machine-made Multi Red Facings (London sites) ... ... ,,	16 3 6
2⅝ in. Hand-made Sandfaced Red Facings (London sites) ... ... ,,	15 18 6
2⅝ in. Hand-made Sandfaced Multi-Colour Facings (London sites) ... ... per 1,000	16 13 6
Hand-made Sandfaced Cherry Red Facings, Berkshire district (London sites) ... ... ,,	18 14 0
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London sites) ... ... ,,	18 14 0
Rubber Bricks for gauged arches (London sites) ... ,,	42 17 6
2⅝ in. Surrey Clamp Burnt Multi Stock Facings (London sites) ... ... ,,	13 14 0
2⅝ in. Surrey Kiln Burnt Multi Stock Facings (London sites) ... ... ,,	15 16 0
Glazed Bricks (London sites), White, Ivory, Brown—	
Stretchers ... ... ,,	64 0 0
Headers ... ... ,,	63 0 0
Quoins, Bullnose and 4½ in. Flats ... ... ,,	80 0 0
Double Stretchers ... ... ,,	85 0 0
Double Headers ... ... ,,	77 10 0
One side and two ends ... ... ,,	87 0 0
Two sides and one end ... ... ,,	89 10 0
Splays and Squints ... ... ,,	83 0 0
Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 32½% for Best quality and plus 32½% less 10% for Second quality.	

PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District.)

	Minimum lorry loads		£ s. d.
Hollow Clay Partition Blocks (Keyed)			
*2 in.	140 yds.	per yd. sup.	4 5
*2½ in.	140 yds.	,,	4 8
*3 in. (3 cavity) ...	120 yds.	,,	5 5
Building Blocks (Keyed)			
*3 in. (6 cavity) ...	110 yds.	,,	5 7
*4 in. (6 cavity) ...	95 yds.	,,	6 10
6 in. (8½ in. × 5⅝ in.)	1,250 blocks	per 1,000	26 18 0
*Half blocks at no extra charge.			
Clinker Concrete			
2 in.	100 yds.	per yd. sup.	3 9
2½ in.	85 yds.	,,	4 4
3 in.	75 yds.	,,	5 3
4 in.	55 yds.	,,	6 5
Cranham			
2 in.	... ...	,,	6 9
2½ in.	... ...	,,	7 5
3 in.	... ...	,,	8 9
4 in.	... ...	,,	10 9
4½ in. Load bearing quality ...	... ...	,,	11 10
Moler Partition Blocks			
2 in.	150 yds.	,,	15 0
2½ in.	120 yds.	,,	15 6
3 in.	100 yds.	,,	16 0
4 in.	90 yds.	,,	19 0
Lightweight Concrete Building and Partition Blocks of Various Sources of Manufacture			
2 in.	100 yds.	,,	5 10
2½ in.	80 yds.	,,	7 0
3 in.	65 yds.	,,	8 2
4 in.	50 yds.	,,	9 8
4½ in.	44 yds.	,,	10 4
6 in.	33 yds.	,,	13 10½
Thermalite-Ytong Partition Blocks			
2½ in.	144 yds.	,,	7 0
Thermalite-Ytong Loadbearing Insulating Blocks			
3 in.	120 yds.	,,	8 5
4 in.	90 yds.	,,	11 0
5 in.	72 yds.	,,	13 9
6 in.	60 yds.	,,	16 6
8½ in.	42 yds.	,,	1 3 8
Floor Blocks and Filler Tiles			
3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads	... ...	per 1,000	34 1 0
4 in. do	... ...	,,	36 10 0
5 in. do.	... ...	,,	43 15 0
6 in. do.	... ...	,,	49 19 0
7 in. do.	... ...	,,	61 8 0
8 in. do.	... ...	,,	71 19 0
12″ × 3″ × ⅝″ Filler Tiles in multiples of 10 tiles per 1,000 multiples			42 15 0
12″ × 4″ × ½″ do. do.			73 15 0

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Revised Standard List (Nov., 1956) prices delivered London Area.

Delivered ex Merchants Wharf or Depot or Manufacturers Works.

	Over 2 tons	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality ...	−2½%	+15%	+22½%
BSS Best do. ...	+10% −2½%	+10% +15%	+10% +22½%
Tested Quality ...	+37½% −2½%	+37½% +15%	+37½% +22½%
BSS Tested do.	+47½% −2½%	+47½% +15%	+47½% +22½%

STONEWARE DRAIN PIPES, etc.—*continued*

	£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths) ... per 1,000	11	10	6
4 in. do. ... ... „	15	3	6
6 in. do. ... ... „	31	9	0
9 in. do. ... ... „	59	13	0

DAMP COURSE

Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area ... ... per yd. sup.		3	5½
Asbestos base ditto 7 lb. per yd. sup. do. do. „		5	3
Lead lined bitumen ditto 9½ lb. per yd. sup. do. „		12	2
18 in. × 9 in. British damp course slates ... ... per 1,000	43	8	11
14 in. × 9 in. do. do. ... ... „	32	8	2
9 in. × 9 in. do. do. ... ... „	18	18	9
18 in. × 4½ in. do. do. ... ... „	19	19	9
14 in. × 4½ in. do. do. ... ... „	15	18	3
9 in. × 4½ in. do. do. ... ... „	10	14	3

STONE

Bath Stone—			
Monks Park ... ... per ft. cube		8	1½
St. Aldhelm Box Ground ... ... „		9	1½
Delivered in railway trucks at South Lambeth B.R. Western Region.			
Doulting Stone Random Blocks. Delivered London area „		8	11
Beer Stone. Delivered London area ... ... „		8	5
Portland Stone—			
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region ... ... „		8	5
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.			
9 in. × 3 in. Rubbed, weathered, throated and stooled cills ... ... per ft. cube	4	1	9
12 in. × 6 in. do. do. ... ... „	2	18	3
12 in. × 3 in. Plain coping, twice throated ... „	2	5	3
12 in. × 3 in. Weathered and twice throated coping „	3	0	3
14 in. × 6 in. do. do. ... ... „	2	14	3
4½ in. × 9 in. Plinth rubbed on top and face ... „	2	8	6
3 in. sawn two sides Slabs, random sizes ... ... per ft. sup.		8	8
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ... per ft. cube	1	9	9
do. do. fair one edge for fair faced brickwork ... ... „	1	15	3
Hard York—			
12 in. × 2 in. Square Steps, rubbed on top and edge per ft. run	10	6	
14 in. × 3 in. Round-nosed Steps, rubbed on top and front ... ... per ft. cube	2	15	6
12 in. × 6 in. Plain Steps, rubbed top and front „	2	8	6
2 in. Rubbed and Jointed Paving, given sizes ... per ft. sup.		9	9
2 in. Sawn Paving, edges squared, in random sizes per yd. sup.	3	8	6

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000			
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29	19	0
Hand-made Pantiles Berkshire district	55	18	0
Hand-made Double Roman Bridgwater district	60	11	6
Hand-made 10½ × 6½ tiles Berkshire district	15	9	0
Machine-made 10½ × 6½ Staffordshire district	14	13	6
Hand-made Hip and Valley tiles per doz.	1	11	3
Machine-made Hip and Valley tiles do.	1	9	6
Concrete tiles 10½ × 6½	8	10	0
do. Interlocking (49S)	19	16	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

24 × 12	143	15	10
22 × 12	116	17	4
22 × 11	105	10	10
20 × 12	99	0	1
20 × 10	94	16	9
18 × 10	65	16	9
18 × 9	57	14	0
16 × 10	51	17	0
16 × 8	40	11	9

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

Softwood—					
Joinery quality	Ex Wharf		per standard	£115 to £140	
Carcassing quality		do.	„	£97 to £102	
1 in. Tongued and Grooved Flooring		do.	„	£110	0 0
Hardwood—					
Mahogany—African S.E.		do.	per ft. cube	1	10 0
do. Honduras do.		do.	„	3	5 0
Oak European do.		do.	„	2	5 0
do. Japanese do.		do.	„	2	10 0
do. English Logs sawn		do.	„	2	0 0
Teak 8 in. average S.E.		do.	„	3	17 6
Walnut African Logs sawn		do.	„	1	5 0

DOORS (in Lots I-11)

Delivered London area	£	s.	d.
1½ in. 4 Horizontal Panel. Pattern 4 in. deal			
2 ft. 0 in. × 6 ft. 6 in. ... ... each	1	16	0
2 ft. 3 in. × 6 ft. 6 in. ... ... „	1	17	6
2 ft. 6 in. × 6 ft. 6 in. ... ... „	1	18	6
2 ft. 9 in. × 6 ft. 6 in. ... ... „	2	0	6
2 in. do. but top panel open. Pattern 4 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... „	2	9	0
2 ft. 9 in. × 6 ft. 6 in. ... ... „	2	11	6
2 in. 2 Panel top panel open. Pattern 2 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... „	2	3	0
2 ft. 9 in. × 6 ft. 6 in. ... ... „	2	5	0

SUNDRIES

Delivered London area.			
1 in. Wood Wool Slabs 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton) ... ... per yd.		6	2
1½ in. do. (67 yds. to 1 ton) ... ... „		8	0
2 in. do. (52 yds. to 1 ton) ... ... „		9	9½
2½ in. do. (45 yds. to 1 ton) ... ... „		11	3
3 in. do. (39 yds. to 1 ton) ... ... „		12	7½
Quantities under 1 ton add 1d. per ½ in. of thickness.			
½ in. imported insulation Board, quantities over 5,000 sq. ft. per 100 sq. ft.	2	2	6
¼ in. Hardboard do. ... ... „	2	1	6
5/16 in. do. do. ... ... „	3	2	6
7/16 in. Asbestos Flat Building Sheets ... ... per yd. sup.		4	3
¼ in. do. ... ... „		5	9½
Roofing Felt 1-ply ... ... „		1	9
do. 2-ply ... ... „		2	2½
Best Scotch Glue in slabs ... ... per ½ cwt.	5	0	0
do. pearl ... ... „	5	5	0
Croid Glue ... ... 28 lb.	2	6	0
Cut Nails 3 in. (1-ton. lots) ... ... per ton	73	0	0
do. 4 in. and up (1-ton lots) ... ... „	69	10	0
Wire Nails 3 in. (4-cwt. lots) ... ... per cwt.	3	6	10
do. 4 in. and up (4-cwt. lots) ... ... „	3	6	3

METALS

STEEL JOISTS, ETC.

Basis Joists—			
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in., 12 in. × 6 in. plain cut to lengths delivered London area ... ... per ton	51	2	6
Extra for sizes			
3 in. × 1½ in. 4 in. × 1¾ in. ... ... „	3	10	0
3 in. × 3 in. ... ... „	2	10	0
4 in. × 3 in. ... ... „	2	5	0
10 in. × 4½ in. ... ... „	1	10	0
5 in. × 2½ in. 5 in. × 3 in. ... ... „	1	15	0
4½ in. × 1¾ in. ... ... „	3	5	0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. „		15	0
6 in. × 3 in. 24 in. × 7½ in. ... ... „	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in. 9 in. × 4 in. 10 in. × 5 in. ... ... „	1	5	0
12 in. × 5 in. 22 in. × 7 in. ... ... „	1	0	0
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in. 14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in. 15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in. 16 in. × 7 in. 16 in. × 8 in. 18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in. „		10	0
Steel angles average price ... ... „	53	2	6
Steel tees average price ... ... „	54	2	6
Fabricated work delivered London—			
R.S. Joists cut and fitted ... ... „	70	12	6
Compound girders ... ... „	77	0	0
Stanchions ... ... „	82	10	0
Compound stanchions ... ... „	87	0	0
In Roof Work—Trusses and Purlins ... ... „	100	12	6
Average prices not for awkward work.			
Angle cleats and ⅝ in., ¾ in. and ⅞ in. bolts average price London area ... ... per cwt.	5	13	0

FERRO-CONCRETE BARS

Mild Steel Ferro-Concrete bars British manufacture to BSS785 ex London Stock ⅜ in. diam., and upwards ... ... per ton	49	17	6
¼ in. diam. ... ... „ extra	8	12	6
5/16 in. do. ... ... „	6	12	6
⅜ in. do. ... ... „	4	12	6
½ in. do. ... ... „	3	2	6

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts :

Galvanised Tube—	Under 1 ton	Over 1 ton	W.I. Fittings	Malleable Fittings
Class A	+24½%	+21½%	Light +48 %	Malleable List
Class B	+37½%	+34½%	Heavy +55½ %	−20½%+40%
Class C	+57½%	+54½%		
Black—				
Class A	+ 4½%	+ 1½%	Light +35½%	Malleable List
Class B	+18¼%	+15 %	Heavy +43¼%	− 20½%
Class C	+34½%	+31½%		

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	3/11½	3/6	1/-
3½ in.	4/3½	3/10	1/-
4 in.	5/6½	4/4	1/6
4½ in.	6/1½	4/10	1/10
5 in.	6/9½	5/3	2/1

METALS—*continued*

C.I.O.G. Gutters

	Gutters	Nozzle	Stop Ends
3 in.	5/1½	4/7	1/3
3½ in.	5/8½	4/7	1/6
4 in.	6/3½	4/10	1/10
4½ in.	6/9½	5/6	2/1
5 in.	7/5½	6/4	2/5

C.I. Rain-water Pipes

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	8/5½	4/4	6/3
2½ in.	8/5½	4/10	8/4
3 in.	9/6	6/–	9/–
3½ in.	10/9½	7/1	10/10
4 in.	12/6	8/7	12/10

L.C.C. Coated Soil Pipes

2 in.	9/7½	7/5	9/–
2½ in.	10/1½	8/3	11/3
3 in.	11/4½	9/–	13/4
3½ in.	12/8½	11/3	15/6
4 in.	14/5½	12/6	18/4

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated February 1, 1955, plus 22½% and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. Coated Drain Pipes

In 9-fts.

	cwt.	qt.	lb.	per yd.	Bends	Branches
4 in.	1	1	17	33/6	23/–	41/–
6 in.	2	0	1	49/2	61/3	98/–

Asbestos Rain-water Pipes and Fittings

All less 17½ per cent. discount.

		2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths	per yd.	4/3	4/6½	5/6	7/3½
Shoes	each	2/9	3/–	3/7	4/10
Single Branches	,,	4/4	5/1	6/1	8/6
Bends square or obtuse	,,	3/–	3/4	4/4	6/1
Swan Necks 4½ in. proj.	,,	3/4	4/4	4/10	6/9
,, 6 in. ,,	,,	3/7	4/4	5/5	7/3

Asbestos O.G. Gutters and Fittings

		4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths	per yd.	4/1	4/5½	5/4	6/4½
Drop ends	each	3/3	3/9	4/5	5/2
Stop ends	,,	1/–	1/1	1/2	1/4
Angles	,,	3/4	3/10	4/8	5/5
Nozzles	,,	3/3	3/9	4/5	5/2
Union Clips	,,	1/7	1/11	2/4	2/8

Asbestos Half-Round Gutters and Fittings

		3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths	per yd.	2/10	3/4½	3/5½	4/1	5/8
Drop ends	each	2/4	2/9	3/–	3/4	4/10
Stop ends	,,	–/11	1/–	1/1	1/2	1/4
Angles	,,	2/8	3/–	3/4	3/7	4/10
Nozzles	,,	2/4	2/9	3/–	3/4	4/10
Union Clips	,,	1/2	1/3	1/4	1/6	2/3

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	49 7 6
Mild Steel Bars	47 12 6
Mild Steel Hoops	44 2 6

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	62 14 6
24 gauge	65 4 6
26 gauge	68 4 6
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	71 12 0
24 gauge	75 2 0
26 gauge	80 7 0
Galvanised flat sheets C.R. and C.A.—	
20 gauge	73 2 0
24 gauge	76 12 0
26 gauge	81 17 0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base prices)		£ s. d.
Sheet BS 1740 S1C 18 SWG (36 in. wide)	per lb.	2 11
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide)	,,	2 8½
Coiled strip BS 1470 S1C 18 SWG (24 in. wide)	,,	2 10
Coiled strip BS 1470 NS 3 Utility 18 SWG (24 in. wide)	,,	2 8
Coiled strip for flashing 99.7% purity 22 SWG (12 in. wide)	,,	3 0½
Corrugated sheet BS 1470 NS 3 Utility Circular Profile 8 ft. × 32 in. × 20 SWG	per sheet	1 12 6
Corrugated sheet BS 1470 NS 3 Utility Industrial Profile 8 ft. × 31½ in. × 20 SWG.	,,	1 18 1
Corrugated sheet BS 1470 NS 3 Utility Mansard Profile 8 ft. × 31½ in. × 20 SWG	,,	1 11 7
Extruded section BS 1476 E1C simple moulding	per lb.	2 9
Extruded section BS 1476 E1C 1 in. diam. round	,,	2 6½
Extruded section BS 1476 HE1WP simple angle	,,	3 0
Extruded section BS 1476 HE10WP 1 in. diam. round	,,	2 11
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG	,,	4 4½
Tubing BS 1471 HT10WP 1¼ in. O/D × SWG	,,	5 8

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

M.O.H.

All per doz.	½ in.	¾ in.	1 in.	1½ in.	1¾ in.	2 in.
Screwdown bib cocks Crutch head for iron	87/–	128/8				
Toilet bib cocks for iron	109/–	158/5				
Screwdown stop cocks for iron	66/–	95/9	188/–	363/–	522/6	917/6
do. with two unions for lead	89/–	132/–	234/4	472/–	623/6	1389/6
Double nut boiler screws	18/8	26/5	47/6	48/6	67/–	93/6
Heavy Croydon ball valves	77/–	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/–
	1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	33/–	40/8	59/6	92/5	118/10	155/3
Brass sleeves		31/11	31/11	56/2	74/10	91/5
	1½×6 lb.		1½×6 lb.	2×7 lb.	3×7 lb.	
Lead P. trap with brass cleaning screws	68/6		85/6	137/–		234/–
Lead S. trap do.	83/–		102/6	168/3		302/–

Solder		s. d.
Plumbers'	1 cwt. lots	332/– 14 lb. lots per lb. 3 6
Tinmen's	,, ,,	408/– ,, ,, 4 1
Blow pipe	,, ,,	411/– ,, ,, 4 3

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 24⅜d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

Extra	d.	Total per lb. d.	approx per ft. d.
½ in. × 19 gauge	14¼	39⅛	10½
¾ in. × 19 ,,	13	37⅝	14½
1 in. × 18 ,,	11½	35⅞	22½
1¼ in. × 18 ,,	10⅜	35¼	26½
1½ in. × 18 ,,	10⅜	35¼	32
2 in. × 17 ,,	12½	36⅝	51½

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras ... ... per ton £246 0 0

Zinc

			s. d.
Sheet Zinc	10 gauge (25 SWG)	5 cwt. lots upwards per cwt.	8 9 0
do.	12 gauge (23 SWG)	,, ,,	8 6 6
do.	14 gauge (21 SWG)	,, ,,	8 5 3

Brass Tubes

		s. d.
Brass tubes basic price, plus gauge and manufacturing extras	per lb.	1 8½

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

		£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	130 5 0
Lead Water Pipe in coils	,,	132 10 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia.	,,	134 0 0
,, over 4 in. dia.	,,	136 0 0
Lead Gas or Untinned Compo pipe	,,	134 0 0
Extras over Basis for quantities under 1 ton		
5 cwt. and under 1 ton	per cwt.	2 0
3 cwt. do. 5 cwt.	,,	4 0
1 cwt. do. 3 cwt.	,,	6 0

Smaller quantities than 1 cwt. priced specially.

Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.

Allowance for Old Lead, collected £80 15s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

					s. d.
Coarse Pink in 1-ton loads and over	Delivered on Site			per ton	8 9 6
do. White	do.	do.	...	,,	8 19 0
Siripite Coarse	do.	do.	...	,,	8 10 6
do. Fine	do.	do.	...	,,	8 18 6
Blue Lias Lime in 6-ton loads	...	...	...	,,	6 14 6
Hydrated Lime (Grey)	do.	...	...	,,	5 17 6
do. (White)	do.	...	...	,,	6 5 0
Lump Lime (Grey)	do.	...	...	,,	5 7 0
do. (White)	do.	...	...	,,	5 14 6
White Keen's or Parian Cement in 1-ton loads			...	,,	12 4 6
Pink Keen's or Parian Cement in 1-ton loads			...	,,	11 19 3
Granite Chips in 6-ton loads	...	...	...	,,	2 8 6
Hair	...	...	...	per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site			...	per yd.	2 5
1,200 yds.	...	...	...	,,	2 4
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site			...	,,	3 0
1,200 yds.	...	...	...	,,	2 11½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft., ⅜ in. thick, 600 yds. and over in one delivery Delivered site	...	...	...	,,	2 8
1,200 yds.	...	...	...	,,	2 7
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site	...	...	...	,,	3 3
1,200 yds.	...	...	...	,,	3 2½

PAINT AND DISTEMPER

		£	s.	d.
Delivered London area				
Ceiling Distemper	per cwt.	1	7	6
Washable Distemper	,,	5	5	0
Gloss Paint	per gal.	2	12	0
Snowcem cement paint (in 1 cwt. drums)	per cwt.	3	11	0
LEAD PRODUCTS AND OILS				
Ground White Lead, in 1 cwt. kegs	per cwt.	8	18	3
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins	per gal.	3	9	6
Genuine Red Lead, Dry, 1 cwt. keg.	per cwt.	6	9	6
Genuine Linseed Oil Putty, 1 cwt. keg	,,	2	14	0
Size XD quality 28 lb.	per tin		9	0
Raw Linseed Oil (5 gal.) drums extra	per gal.		18	6
Boiled Linseed Oil (5 gal.) do.	,,		19	0
SUNDRIES				
Turpentine substitute (5 gal.) drums extra	,,		5	3½
do. do. (40 gal.) do. do. ...	,,		4	7⅛
Solignum, Brown (5 gal. cans) Exterior	,,		8	4
Creosote (40 gal. barrels)	,,		2	3
Paste Powder (1 lb. packets)	per lb.		2	0
White Lining Paper	per piece		1	2½

VARNISHES, etc.

		£	s.	d.
Delivered London area				
Oak Varnish, Outside or Inside	per gal.	2	0	0
Oak Pale Copal do.	,,	2	0	0
Hard Drying Oak for Inside	,,	2	5	0
Crystal Paper Varnish do.	,,	2	8	0
Eggshell Flat Varnish do.	,,	2	6	0
Finest Carriage Varnish	,,	2	7	0
Front Door Varnish	,,	2	4	0
Japan Gold Size	,,	1	18	0
Black Japan	,,	1	16	0
Brunswick Black	,,	1	12	0
Berlin Black	,,	1	10	0
Terebene	,,	1	17	0
Knotting (1 gal. bottles free)...	,,	2	8	0
French and Brush Polish (do.)	,,	2	2	0

GLASS

	per ft. super s.	d.
Delivered London area		
18 oz. Sheet Glass Ordinary Glazing Quality-Cut Sizes		7½
24 oz. ,, ,, ,, ,, ,, ,,		9¾
26 oz. ,, ,, ,, ,, ,, ,,	1	0½
32 oz. ,, ,, ,, ,, ,, ,,	1	3⅞
⅛ in. Rolled Plate		11¼
⅛ in. Rolled and Rough Cast	1	3
¼ in. ,, ,, ,, ,, ...	1	3½

	per ft. super s.	d.
⅛ in. Figured Rolled and Cathedral, Standard patterns :		
White Group 1		11½
do. Group 2	1	3½
do. Standard Tints	1	10
do. Special Tints	6	8
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating Group 3	1	4½
¼ in. Wired Cast	1	7½
¼ in. Georgian Wired Cast...	1	7½
Hollow Glass Blocks—	Each	
P.B.2. 5¾ × 5¾ × 3⅞ in.	3	3
P.B.3 7¾ × 7¾ × 3⅞ in.	5	0
P.B.32 7¾ × 7¾ × 3⅞ in.	5	0
Radiused Corner Blocks to match up with—		
P.B.2	6	0
P.B.3	7	6
P.B.32	7	6
¼ in. Polished Plate Glass, G.G. Quality—	Per ft. super	
In plates not exceeding 2 ft. sup.	3	10
,, ,, ,, 5 ft. sup.	4	9
,, ,, ,, 45 ft. sup.	5	7
,, ,, ,, 100 ft. sup.	6	0
¼ in. Polished Plate, extra sizes, *i.e.*, plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality—Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways	9	0
Not exceeding 180 ft. sup. or ditto	12	1
Plates exceeding 180 ft. sup. prices on application.		
Substances other than ¼ in. Polished Plate at Special Prices.		

Quantity Tariff—Sheet and Sundry Glass.

The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. sup. s.	d.
18 oz. sheet O.Q.	3,000		5¾
24 oz. ,, ,, ...	2,000		7½
26 oz. ,, ,, ...	2,000		9¼
32 oz. ,, ,, ...	2,000	1	0⅞
⅛ in. Rolled Plate	1,000		8⅜
⅛ in. Figured Rolled and Cathedral Standard Patterns, White Group 1	1,000		8¾
do. Group 2	1,000		10½
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte Group 3	1,000		11⅞
⅛ in. and ¼ in. Rolled Plate or Rough Cast ...	2,000	1	0
¼ in. Wired Cast, Hexagonal	2,000	1	2
¼ in. Georgian Wired Cast	2,000	1	2½

The Builder

CURRENT RATES OF WAGES

AS FROM MAY 27, 1957. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1
Craftsmen	4/6	4/5½
Labourers	3/11½	3/11

Town.	*Grade.*
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A1
Accrington	A
Addlestone	A
Afan Valley	A
Aldeburgh	A1
Aldershot District	A1
Alfreton UD	A
Alnwick UD	A
Altrincham	A
Amble	A
Ambleside	A1
Amersham	A1
Ammanford	A
Andover	A1
Anglesey, Isle of	A1
Ardingly	A1
Arundel	A1
Ascot	A1
Ashbourne RD	A1
Ashbourne UD	A1
Ashby-de-la-Zouch UD	A
Ashby Woulds UD	A
Ashford (Kent)	A1
Ashford (Middlesex)	A
Ashington UD	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A1
Atherstone RD	A
Attleborough	A1
Axminster	A1
Aylesbury	A1
Aylsham	A1
Bagshot	A1
Bakewell UD	A1
Banbury	A1
Bangor	A1
Barnard Castle UD	A
Barnoldswick UD	A
Barnsley CB	A
Barnstaple	A1
Barrow-in-Furness	A
Barrow-upon-Soar RD (part Thrussington)	A1
Barry	A
Basford RD (exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley MB	A
Baxterley	A1
Beaconsfield District	A
Bearl	A
Beccles	A1
Bedale RD	A
Bedford	A
Bedlington	A
Bedlingtonshire UD	A
Bedwas	A
Beeston & Stapleford UD	A
Belper UD	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick Borough	A
Beverley MB	A
Bewdley MB	A
Bexhill-on-Sea	A1
Bideford	A1
Biggleswade	A1
Billericay	A
Billing	A
Billingham UD	A
Bilsthorpe	A
Bilston MB	A
Birchington	A1
Birkenhead	•
Birmingham CB	†A
Bishop Auckland UD	A
Bishop's Stortford	A
Bishops Castle MB	A1
Bispham	A
Blackburn	A
Blackpool	A
Blackwell RD	A
Blandford	A1
Blaydon UD	A
Blidworth	A
Blyth B.	A
Bodmin	A1
Bognor Regis	A1
Boldon UD	A
Bolsover UD	A
Bolton	A
Boston MB	A
Bourne End	A
Bournemouth District	A
Brackley MB	A1
Bracknell	A1
Bradford CB	A
Bradford-on-Avon	A1
Braintree	A1
Brandon & Byshottles UD	A
Brecon—Borough of	A1
Breconshire, County of ...	‡A1
Brent Knoll	A1
Brentwood	A
Bridgend	A
Bridlington MB	A
Bridlington RD	A1
Bridgnorth MB	A1
Bridgnorth RD	A1
Bridgwater	A1
Brierfield	A
Brighouse MB	A
Brighton & Hove	A
Bristol District	A
Broadstairs	A1
Bromsgrove UD	A
Broughton, Flint	A
Buckfastleigh	A1
Buckingham	A1
Buckley	A
Bungay	A1
Burnham-on-Crouch	A1
Burnham-on-Sea	A1
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Caernarvon	A1
Caernarvonshire, Cnty. of	‡A1
Calder Valley	A
Camberley District	A1
Cambridge	A
Cannock UD	A
Canterbury	A1
Cardiff	A
Cardiganshire, County of	‡A1
Carlisle	A

CURRENT RATES OF WAGES—Continued

Town.	Grade.
Carlton UD	A
Carmarthen—Borough of	A1
Carmarthenshire, Cnty of	‡A1
Carnforth	A
Castleford UD	A
Caterham	A
Chapel-en-le-Frith	A
Chard	A
Charmy Down	A
Chatham District	A
Chatteris	A1
Cheadle (Staffs) RD	A
Chelmsford	A
Cheltenham	A
Chepstow	A
Chertsey	A
Chester	A
Chester-le-Street UD	A
Chesterfield MB	A
Chesterfield RD	A
Chichester	A
Chipping Norton	A1
Chipping Sodbury	A1
Chippenham (inc. Chippenham Within and Hardenhuish)	A1
Chorley	A
Cirencester	A
Clacton	A1
Clay Cross UD	A
Cleethorpes MB	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville UD	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A
Congleton	A1
Consett UD	A
Conway	A1
Corby UD	A
Cornwall, County of	‡A1
Corsham District	A
Coventry CB	A
Cranbrook	A1
Cranleigh	A1
Cranwell Aerodrome Site	A
Crawley	A1
Crewe	A
Crewkerne	A1
Cromer	A1
Crook and Willington UD	A
Crowborough	A1
Cuckfield	A1
Cwmbran	A
Dalton-in-Furness	A
Darlington CB	A
Dartmouth	A1
Darwen	A
Daventry MB	A
Deal	A1
Denbigh Town	A1
Derby CB	A
Devizes	A1
Devon, County of	‡A1
Dewsbury CB	A
Didcot	A1
Diss	A1
Doncaster CB	A
Dorchester	A1
Dorking	A
Dorset, County of	A1
Dover	A
Dovercourt	A
Driffield UD	A1
Drigg & Carleton	A
Droitwich MB	A
Dudley CB	A
Dunstable	A
Durham B	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A1
East Kesteven RD	A1
East Retford MB	A
Eastwood (Notts) UD	A
Ebbw Vale & District	A
Edenbridge	A1
Ely	A1
Epping	A
Evesham MB	A1
Exeter	A
Exmouth	A1
Fakenham	A1
Falmouth	A1
Fareham	A
Faversham	A1
Felixstowe	A1
Filey UD	A
Fleetwood	A
Flint MB	A
Folkestone	A1
Frinton	A1
Frome	A1
Gainsborough UD	A
Gateshead CB	A
Gillingham (Dorset)	A1
Gillingham (Kent)	A
Glastonbury & Street	A1
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of	‡A1
Godalming	A1
Goole, MB	A
Goole RD (part—Airmyn, Hook)	A
Gosport	A
Grantham MB	A
Gravesend	A
Grays Thurrock UD Area	A
Great Yarmouth	A
Grimsby CB	A
Grimsby RD (part)	A1
Guildford District	A1
Halesowen MB	A
Halifax CB	A
Halstead	A1
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate MB	A
Hartlepool B	A
Harwell	A
Harwich	A1
Haslemere	A
Hastings	A1
Hatfield (Herts)	A
Havant	A
Haywards Heath	A
Heanor UD	A1
Hemel Hempstead	A
Henley-on-Thames	A1
Hereford	A1
Herefordshire, Cnty. of	‡A1
Herne Bay	A1
Hertford	A
Hexham RD	A
Hexham UD	A
Heysham	A
Heywood	A
Higham Ferrers MB	A
High Wycombe	A
Hinckley UD	A
Hitchin	A
Hoddesdon	A
Holywell	A
Horley	A1
Horncastle UD	A1
Horsham	A1
Horwich	A
Huddersfield CB	A
Hull	A
Hunstanton	A1
Huntington (Staffs)	A
Ilfracombe	A1
Ilkeston MB	A
Ilkley UD	A
Ipswich	A
Isle of Sheppey	A1
Isle of Thanet	A1
Isle of Wight	A1
Jarrow B	A
Keighley MB	A
Kendal	A
Kenilworth UD	A
Kettering MB	A
Keynsham	A
Kidderminster MB	A
Kingskerswell	A
King's Lynn	A1
Kingsteignton	A1
Kirkham	A
Knaresborough UD	A
Knutsford	A
Lancaster	A
Leamington MB	A
Leatherhead	A
Leeds CB	A
Leek UD	A
Leicester CB	A
Leighton Buzzard	A1
Leiston	A1
Leominster	A1
Letchworth	A
Lewes	A1
Lichfield MB	A
Lincoln CB	A
Liskeard	A1
Littlehampton	A1
Liverpool	*
Llandudno	A1
Llanelly (incl. Llanelly RD)	A
Llanfairfechan	A1
Llangollen	A1
London	*
Long Eaton	A
Looe	A1
Loughborough MB	A
Louth MB	A1
Lowestoft	A
Loxton	A1
Ludlow MB	A1
Ludlow RD	A1
Luton	A
Lyme Regis	A1
Lyneham (Devon)	A1
Lytham	A
Macclesfield	A
Maidenhead	A
Maidstone	A
Maldon (Essex)	A1
Maltby UD	A
Malton UD	A1
Malvern UD	A1
Manchester	A
Manningtree	A1
Mansfield MB	A
March	A1
Margate	A1
Market Harborough RD	A1
Market Harborough UD	A
Market Rasen UD	A1
Martock	A1
Maryport	A
Matlock UD	A
Melksham	A
Melton Mowbray UD	A1
Merionethshire	A1
Merthyr	A
Mexborough UD	A
Middlesbrough CB	A
Middleton	A
Middlewich	A
Mildenhall	A1
Milford Haven UD	A1
Minehead	A
Monmouth—Borough of	A1
Monmouthshire	A1
Morecambe	A
Moreton Valence	A1
Morley	A
Morpeth B	A
Morpeth RD	A
Mundesley	A1
Nantwich	A
Neath & Valley	A
Nelson	A
Newark MB	A
Newbury	A
Newcastle-on-Tyne CB	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A1
Newquay	A1
Newton Abbot	A1
Normanton UD	A
Northallerton District	A
Northallerton UD	A
Northampton CB	A
North Shields	A
North Walsham	A1
Northwich	A
Norton Radstock	A1
Norwich	A
Nottingham CB	A
Nuneaton MB	A
Oakham RD	A1
Oakham UD	A1
Okehampton	A1
Oldham	A
Ongar	A
Ormskirk	A
Ossett & Horbury	A
Oswestry	A1
Oundle UD	A1
Oxford	A
Oxted	A1
Padstow	A1
Paignton	A1
Par	A1
Pembrokeshire (except Milford Haven)	A1
Penmaenmawr	A1
Penrith UD	A1
Penzance	A1
Peterborough, Soke of (Eastern Regional portion)	A1
Petersfield	A1
Pickering	A1
Plymouth	A
Pontefract MB	A
Pontypool & District	A
Pontypridd District	A
Porthcawl	A
Portishead	A
Portland Bill	A1
Portsmouth	A
Port Talbot	A
Preston	A
Princetown	A
Pudsey MB	A
Pulborough	A1
Radnorshire, County of	‡A1
Ramsgate	A1
Raunds UD	A
Rayleigh	A
Reading	A
Redcar B	A
Redditch UD	A
Redhill & Reigate	A
Rhondda Valley	A
Richmond B (Yorks)	A
Ripon MB	A
Rochdale	A1
Rochester	A
Ross-on-Wye	A
Rossendale Valley	A
Rotherham CB	A
Royston	A1
Rugby MB	A
Rugeley UD	A1
Rushden UD	A
Saffron Walden	A1
St. Albans	A
St. Austell	A1
St. Helens	A
St. Neots	A1
Salisbury City	A1
Salisbury Plain	A1
Sandy	A1
Sawbridgeworth	A
Saxmundham	A1
Scarborough MB	A
Scunthorpe MB	A
Seaford & Newhaven	A
Selby UD	A
Sevenoaks	A
Shaftesbury	A1
Sheerness	A1
Sheffield MB	A
Shepton Mallet	A1
Sherborne	A1
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury MB	A
Sirhowy Valleys	A
Sittingbourne	A1
Skegness UD	A1
Skipton UD	A
Sleaford UD	A1
Slough, Windsor & Eton District	A
Smethwick CB	†A
Snettisham	A1
Solihull UD	A
Somerset, County of	‡A1
Southampton and Eastleigh	A
Southend-on-Sea Dist.	A
Southport	A
South Shields CB	A
Southwold	A1
Spalding UD	A1
Stafford MB	A
Staines	A
Stamford MB	A1
Stantonwick	A
Stevenage	A
Stockport	A
Stockton RD	A
Stockton-on-Tees B	A
Stoke-on-Trent CB	A
Stoke Orchard	A1
Stourbridge MB	A
Stourport UD	A
Stowmarket	A
Stratford-on-Avon MB	A1
Stroud (RD Area)	A1
Sunderland CB	A
Sunningdale	A1
Sutton Coldfield MB	A
Swadlincote UD	A
Swaffham	A
Swanage District	A1
Swansea	A1
Swindon District	A
Swinton UD	A
Tamworth MB	A
Taunton	A
Tavistock	A1
Tenterden	A1
Teignmouth	A1
Tewkesbury	A1
Thames Haven	A
Thetford	A
Thirsk RD	A1
Thorpe Bay	A
Thurrock UDC Area „ North of to Billericay	A
Tilbury	A
Todmorden MB	A
Tonbridge	A
Torquay	A1
Totnes	A1
Tring	A1
Trowbridge	A1
Truro	A1
Tunbridge Wells	A1
Tynemouth CB	A
Ulverston	A
Uppingham (Salop)	A
Uttoxeter RD	A1
Uttoxeter UD	A1
Wakefield CB	A
Wakefield RD	A
Walsall CB	A
Wallsend B	A
Walsden	A
Walton-on-Naze	A1
Ware	A
Warminster	A
Warrington	A1
Warwick MB	A
Wednesbury MB	A
Wellingborough UD	A
Wellington UD	A
Wellington (Somerset)	A1
Wells (Norfolk)	A1
Wells (Somerset)	A1
Welwyn	A
Welwyn Gar. City	A
West Bromwich CB	A
Westbury	A1
Westcliff-on-Sea	A
Westerham	A1
West Hartlepool CB	A
Westmorland (except Kendal)	A1
Weston-super-Mare	A1
Weybridge	A
Weymouth (including Portland Bill, excluding Portland Stoneyards)	A1
Whitby UD	A1
Whitby RD	A1
Whitehaven	A
Whitley & Monkseaton UD	A
Whitstable and District	A1
Wickford	A
Widnes	A
Wigan	A
Wigton	A1
Wilmslow	A
Wilts. County of	‡A1
Wimborne	A1
Wincanton	A1
Winchester	A1
Windermere	A1
Wisbech	A1
Witham	A1
Withernsea UD	A1
Woking	A1
Wokingham	A1
Wolverhampton CB	A
Wolverton District	A1
Woodbridge	A1
Woodhall Spa UD	A1
Woodstock	A1
Worcester CB	A
Workington	A
Worksop MB	A
Worthing	A1
Wrexham (incl. Cefn)	A
Wroughton	A1
Wylam	A
Wymondham	A1
Yate	A1
Yeovil Borough	A1
York CB	A
Ystalyfera	A

*For Birkenhead, Liverpool and London the rates are:—Craftsmen, 4s. 7½d.; Labourers, 4s. 1d. In the case of London the rate beyond the 12-mile radius is: Craftsmen, 4s. 7d.; Labourers, 4s. 0½d. †Plus 2d. per working day. ‡This is the County rate and applies except where higher grades are stated.

NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 3s. 7½d. per hour. Women engaged on work other than craft processes, 3s. 3½d. per hour.

For Building Trade Wages in Scotland see page 303

The Builder Review of PLANT & MATERIALS

Floor Covering

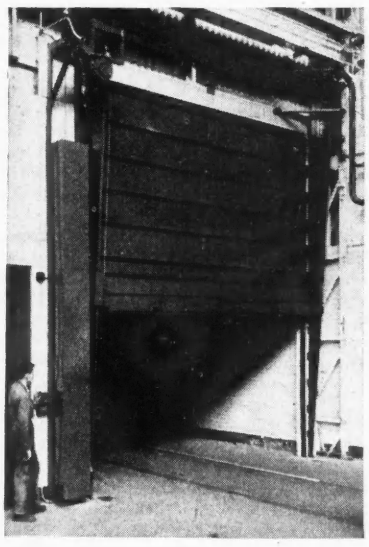
A NEW product, 'Bituflor' latex screeding compound, by British Bitumen Emulsions, Ltd., Dundee-road, Trading Estate, Slough, Bucks, is claimed to provide a quick-set, waterproof base for floor coverings that can be feathered off and which will accept all normal flooring adhesives. 'Bituflor' latex screeding compound is ready to receive linoleum or tiles from 12 to 24 hours after laying, depending upon the atmospheric conditions on the site.

Ladder Tray

An all-metal, cellulose finished, adjustable tray has been produced by Simplex Products, Lamberts Yard, Tipping-street, Altrincham, Cheshire, designed to hang from a rung of a ladder. Fitted with two stays, the tray can be adjusted to varying angles of lean of the ladder while remaining horizontal. It is suitable for holding tools, paint, timber, gutter sections and so on, and it has been tested to hold 50 lb.

Vertical Folding Door

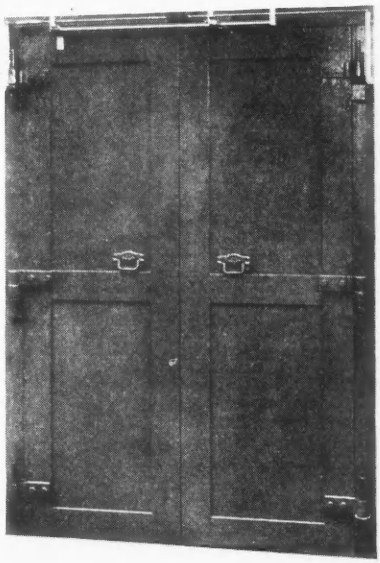
A mechanically-operated folding door that operates vertically upwards has been installed at the Rogerstone factory of the Northern Aluminium Co., Ltd. Known as the 'Welpak,' it was designed and made by Westland Engineers, Ltd., of Yeovil, Somerset. The opening illustrated is 17 ft. 3 in. high and 14 ft. 7 in. wide; opening time is claimed to be 15 secs.



Welpak' door, by Northern Aluminium Co. Ltd.

Self-closing Fireproof Doors

Haywards, Ltd., of 187, Union-st., SE1, have for many years specialised in the manufacture of steel fire-resisting doors to comply with London County Council and Fire Offices Committee specifications, and their most recent development for minimising fire risk in industrial buildings consists of a patented appliance comprising three component units:—1. Enclosed helical hinges in which all the moving parts are enclosed in an oil bath. These eliminate the necessity for rising floor quadrant tracks and wheels, or springs, and are of particular value where the cill bar of a self-closing door is above the general floor level, as is frequently the case in oil storage chambers. 2. A braking device which enables the door leaves to be held at any desired position prior to a fusible link coming into operation. 3. A selector gear which ensures the correct closing sequence of the door leaves and is brought into operation by a fusible link in the event of a fire. As will be seen from the illustration, the whole of the appliance is mounted within the compass of the door frame and builder's work is therefore reduced to the minimum, i.e., the building in of door frame lugs only.



Steel fire-resisting door by Haywards, Ltd.

Anti-static PVC Flooring

In response to the requests from hospitals for an anti-static flooring for use in operating theatres and other places where static electricity is a potential hazard the Adamite Co., Ltd., 94, 98, Petty France, London, SW1, have developed a special anti-static quality of their 'Vynoleum' and 'Altro' pure PVC flooring.

TRADE NEWS

New Chipboard Plant

The Airscrew Co. and Jicwood, Ltd., is planning to install additional plant at Weybridge, Surrey, within the next two years to produce a new improved woodchip board. This was disclosed by the company's commercial manager, D. B. M. Wright, when a party of 28 members from southern areas of the Federation of Master Builders visited the Weybridge factory recently.

Laboratory Contract

Griffin and George, Ltd., were awarded the contract for laboratory furniture in the new Chance-Pilkington Optical and Ophthalmic Glass Works at St. Asaph, Flintshire. The architects are Ormerod and Partners.

Landed Stock List

A new list of plywood, blockboard and laminated board has been published by C. F. Anderson and Son, Ltd., Islington, London, N1.

British Tower Cranes

Acrow (Engineers), Ltd., London, W2, are to manufacture a range of rail-mounted tower slewing cranes available for delivery in the first part of 1958. The company state that these British cranes, built to BSS 2799, will have lifting capacities from 25 cwt. to four tons; equipped with luffing jibs operating up to 100 ft. radius, they will be capable of dealing with structures up to 110 ft. high at parapet but with actual lifting heights up to 193 ft. In view of the many cranes of this type now imported from abroad, this news will have special interest for the building and civil engineering industries.

EXCAVATOR / CRANE.—The 'Bambino,' by J. W. & T. H. Carter, Ltd., 83, Sharp-st., Hull, has been designed as an all-purpose tool. It is available with either wheels or tracks (changeover takes an hour) and a variety of front-end attachments for digging, laying, lifting, and so on. The power unit is a 12/20 b.h.p. two-cylinder air-cooled diesel.

NEWS IN BRIEF

Employment in Building

THE number employed in building and contracting in Great Britain at the end of June was 1,509,000, a decrease of 1,000 compared with the end of May, states the Ministry of Labour and National Service. At the end of June, 1956, the figure was 1,541,000.

Road Hauliers Directory

The Road Haulage Association have issued their first edition of the Directory of Long Distance Hauliers, 1957, in which the names of members of the Association are listed alphabetically under the names of towns in which they have depots.

Aluminium Brazing

The Aluminium Development Association have issued Information Bulletin No. 22 on 'The Brazing of Aluminium and its Alloys' (price 2s.). The bulletin opens with a brief comparison of the principal methods of brazing, and deals with the basic principles, including an essential note on the operation of capillary flow. The properties of aluminium and some of the alloys suitable for brazing are tabulated and corresponding data given for aluminium filler alloys. Preliminary notes to the operations proper include information on fluxes, references to joint design, and notes on preparation for brazing, on fluxing and stopping off. The bulletin concludes with information on the brazing of aluminium to other metals.

FCEC Handbook

The Federation of Civil Engineering Contractors have issued the 1957-58 edition of their handbook, which brings together in convenient form all the main Federation documents. It includes an up-to-date copy of the Working Rule Agreement of the Civil Engineering Construction Conciliation Board, the current editions of the ICE Conditions of Contract and the Federation Dayworks Schedules and an up-to-date list of the Members of the Federation. Copies may be obtained (price 12s. 6d.) from the Federation of Civil Engineering Contractors at Romney House, Tufton-street, Westminster.

COAL UTILISATION EFFICIENCY

'Improvements Needed'

THE need for improvement in the equipment in which coal is burned and in the methods of preparing coal for market in implementing the requirements of the Clean Air Act of 1956, are stressed in the annual report of the British Coal Utilisation Research Association. This need is additional to the need for economy through efficiency in coal utilisation, the report states. 'Both industrial and domestic consumers, in co-operation with the producers of fuel, have parts to play in attaining this desirable end, and can benefit from the scientific approach to coal utilisation that research embodies.'

In reviewing the work of the Association during 1956 the report states: 'Helping to bridge the gap between suitable coal supplies and energy requirements and assisting the implementation of the Clean Air legislation have been major objectives of the research work in BCURA during the past year.'

The link between the National Industrial Fuel Efficiency Service and BCURA had been further strengthened by the formation of a Joint Co-ordinating Committee which facilitated the exchange of technical experience of the two organisations so that maximum help was given to industrial fuel users.

During the year the Association had enrolled its first Commonwealth member, the State Electricity Commission of Victoria, Australia. The report adds 'it is known that other Commonwealth organisations intend to follow this lead.'

In an attempt to bring the results of the Association's work quickly and clearly to the notice of its members a system of technical Digests had been introduced and well received.

COMPANY NEWS

Roberts Adlard & Co., Ltd., have recommended a final dividend of 12½ per cent., less tax, for the year ended March 31.

Horseley Bridge & Thomas Piggott, Ltd., have recommended a final dividend of 17½ per cent. less tax, on the ordinary capital of the company, making a total of 22½ per cent. for the year ended March 31.

Oldham and Son, Ltd., have recommended a final ordinary dividend of 10 per cent., less tax, for the year ended March 31, which makes a total dividend of 17½ per cent. (same) for the year.

Stuart Construction, Ltd., have recommended a first and final dividend of 15 per cent., less tax, on the ordinary shares of the company (same) for the year ended March 31.

THE ARCHITECT SPECIFIES

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OVERSEAS BUILDING

From Our Own Correspondents

HONG KONG.—It is calculated that more than $150 m. have been spent by private investors on new building work during the past 12 months in the urban areas of the colony; 2,200 structures account for this figure, the second highest in seven years, giving the sum of $116 m. as the annual average over that period. These figures do not include Government building, the Armed Forces expenditure, or the value of land purchases. . . . A site of 5,000 sq. ft. on Hong Kong's waterfront, on Connaught-road, between the old P & O building and the new Fung House, is to be used for a 19-storey office building to designs now under preparation by Mr. Steven S. L. Yue, BSc, authorised architect. The building, estimated to cost $3,000,000, will be of reinforced concrete on pile foundations, and will have three high-speed lifts. . . . The Director of Education has announced that sites have been selected for eight new Government schools to provide places for about 8,000 children, and eight other sites are under consideration. . . . Mr. Steven S. L. Yue, 407, Marina House, Hong Kong, is architect for a new $1½ m. building at Leighton-road, just granted approval by the Tenancy Tribunal. The building will be 10 storeys high and there will be three passenger lifts.

JAPAN.—At the same time that a mission from the UK, including representatives of the Taylor Woodrow-Simon Carves group, is meeting the Japanese authorities to discuss the construction of atomic power stations, it is announced that the US Atomic Energy Commission is to provide $350,000 (US) to assist in building nuclear research reactors.

MALAYA.—The architect for a new £200,000 cinema to be built in Kim Seng-road, Singapore, is Mr. Ho Kok Hoe. This cinema, which will have 1,200 special foam rubber seats, will be the 100th owned by two Singapore brothers. They are Mr. Run Run Shaw and Mr. Run Me Shaw. . . . In view of the demand for low-cost buildings of all types, Singapore Engineers, Ltd., are working with Diethelm and Co., Ltd., to erect a prototype Chee-Dex house. In essence, the system being used consists of aerated lightweight reinforced concrete panels, made according to the Cheecol patented process, being fixed to Dexion building framework. . . . Three crematoria, which will cost about £80,000, are to be built by the Singapore City Council in Upper Aljunied-road. Mr. M. E. Crocker, the acting city architect, said the whole project would take about 18 months to complete. They will be built on the lines of Western design.

Abattoirs for Nigeria

African orders worth £140,000 have been won against German and Danish competition by IWEL, Limited, of London. They are for designing and equipping abattoirs at Khartoum in the Sudan, and at Kano, Nguru and Maiduguri in the Northern Province of Nigeria. The contract for the abattoir at Khartoum has been signed with the Depart-

ment of Animal Production which is a part of the Animal Resources Ministry of the Sudan Government. The steel frame building is being supplied by Steel Construction, Ltd., of Khartoum which is an associated company of H. Young Co., Ltd., of London. IWEL will be co-operating with this company for internal plant steel work.

The Kano contract has been placed with IWEL through the Crown Agents to the Colonies.

All three by-product plants are due to be shipped by December, 1957. The abattoirs at Nguru and Maiduguri are due to be completed by March, 1958, whilst the abattoir at Kano will be completed by July, 1958.

African Visit

Mr. P. Whiteley, BSc. ARIC, the Paint Research Fellow appointed by the Colonial Office to study problems of paint and its application in tropical areas, is leaving on August 23 to visit Africa. Mr. Whiteley, who is based in England with the Colonial Liaison Section, Building Research Station, Department of Scientific and Industrial Research, will be visiting the principal East African territories, Northern and Southern Rhodesia and South Africa. Returning by way of Nigeria and Ghana, Mr. Whiteley will visit the West African Building Research Institute, Accra. He expects to arrive back in the UK at the end of November.

New Libyan Capital

Libya is to build a new capital city, and British engineering firms are to be given the task of supervising and co-ordinating the project. Reporting this, Barclays Bank DCO, says that the Federal Government has set a limit of two years for the achievement of this operation.

The building of office blocks and staff accommodation and the installation of the required public utility services are being pressed forward urgently. The new capital will be at Beida in the Jebel Akhdar. The Libyan Public Development and Stabilisation Agency is calling in British engineering firms to supervise and co-ordinate the many projects which will be implemented in order to make El Beida suitable for the purpose.

PERSONAL COLUMN

MR. W. A. T. KENNEDY has recently been appointed manager of the tractor sales and service department of Thos. W. Ward, Ltd., Albion Works, Sheffield.

CAPTAIN F. G. WAYMAN, chairman and managing director of Rocol, Ltd., Swillington, Leeds, and MR. G. J. VINEALL, director of research, left on August 8 for an intensive three weeks sales tour of the principal engineering cities in the USA.

MR. E. H. BEAUMONT has been appointed director of the Industrial Adhesives Division of Evode, Ltd., of Stafford.

MR. R. M. WALSH, 142, Tressillian-road, Brockley, SE4, has been appointed as additional representative for F. Hills & Sons, Ltd., Stockton-on-Tees, to cover the county of Kent.

MR. G. M. BEHR has been appointed general sales manager of Ascot Gas Water Heaters, Ltd., for both home and overseas markets. MR. G. E. JEFFS is to be sales manager (London) and deputy to Mr. Behr. MR. G. MICHIE will be Northern manager (Glasgow). MR. D. GOFFIN has been appointed Continental representative and MR. F. TAYLOR export representative.

MR. KENNETH WEEKS has been appointed by Concrete, Ltd., 16, Northumberland-avenue, WC2, as an additional representative in the Midlands area.

MR. A. E. POTTER, director of Expandite, Ltd., Chase-road, NW10, left on August 8 on a tour covering the company's interests in Australia, New Zealand and India.

MR. H. H. HELBY has been appointed general sales manager, of the industrial products division, North British Rubber Co., Ltd., Castle Mills, Edinburgh 3.

MR. ROBERT WALKER, who has been chairman of The Cape Asbestos Co., Ltd., since 1934, has decided to retire from the board on August 31. MR. GILES NEWTON, deputy chairman and managing director, has been elected chairman and MR. R. H. DENT and MR. T. C. HALE appointed joint managing directors. MR. RUPERT RILEY will at his own request concentrate upon the control and co-ordination of sales throughout the group. MR. T. MUIR WARDEN, who has been Mr. Walker's alternate since 1954, has been appointed a member of the board.

The SCOTTISH BUILDER

Housing Subsidies in Scotland

DETAILED guidance to local authorities about the housing subsidy provisions of the Housing and Town Development (Scotland) Act is given in a circular issued on July 24 by the Department of Health for Scotland. The circular recapitulates the rates of subsidy which are payable for all houses completed after July 17—the date on which the Act came into force—except where tenders were approved before August 1, 1956.

Briefly, the new rates of subsidy are £24 for houses not qualifying for special subsidy; £30 for houses to meet the urgent needs of incoming industry; £36 for agricultural population houses and £42 for 'overspill' houses.* The Act also enables additional subsidy to be paid for multi-storey flats and for houses provided in remote areas.

Councils are reminded in the circular that 'it is assumed they will use the subsidies as a pool applicable to all their houses. In doing so they may think it desirable to introduce rent schemes providing for differential rents or rent rebates.'

Where Councils can show that they are faced with an urgent housing problem that they cannot tackle unaided without charging unreasonably high rents, or creating an unreasonably heavy rate burden, the Secretary of State will be prepared to consider asking the Scottish Special Housing Association, within the limits of its annual programme, to come to the aid of these authorities by building a proportion of the houses required. The Council will be expected to show that they are themselves undertaking a programme involving a substantial contribution towards meeting outstanding needs.

Of the additional subsidy for multi-storey flats the circular says that 'the Secretary of State considers that blocks of at least eight storeys are normally to be preferred if the provision of lifts, refuse chutes and other services is to be economic, and before he could approve proposals for blocks of flats of six or seven storeys, he would require to be satisfied that higher blocks could not suitably be erected because of site conditions or other substantial reasons.'

* The old rates of subsidy are:—£39 15s., £42 5s. and £46 15s. for a three-, four and five-apartment house, respectively, with an additional subsidy of £12 for each house provided for the agricultural population.

SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from May 27, 1957. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen 4s. 6d.; Labourers 3s. 11½d.

For apprentices, the rates are:

Year.	*Percentage of Craftsman's rate.*	*For week of 44 hours* s. d.
1st	25	49 6
2nd	33⅓	66 0
3rd	50	99 0
4th	66⅔	132 0
5th	75	148 6

For female labour, the rates are:

	s. d.
Operatives on craft operations (at end of probationary period)	3 11½
Operatives on labouring operations (at end of probationary period)	3 5½

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NEW BUILDINGS

Dumfries CC.—Tenders invited for work in connection with the erection of a two-span concrete bridge 80 ft. long and 30 ft. wide over the Nith between Kirkconnel and Kelloholm. Or alternative form of bridge suitable for this purpose. A footbridge of 45 ft. span and 4 ft. 6 in. wide over Crawick Water near Sanquhar. Tenders by September 14 to County Clerk, County-bldgs., Dumfries.

Dundee.—Plans approved by TPC for covered enclosure, 70 ft. long at Tannadice Park.

Grangemouth.—Plans approved by DofGC for site preparation work, estimated cost £750,000, at Grangemouth Airfield for new chemical plant to be built by British Hydrocarbon Chemicals, Ltd. SSHA to build 146 houses on airfield at estimated cost of £185,000.

Lanark CC.—Tenders invited for work in connection with erection of Daer and Powrail primary school. All trades. Applications to I. V. Paterson, Lanarkshire House, Ingram-st., Glasgow before August 19.

Larbert.—Plans for extensions to Larbert High School submitted to County EC. Estimated cost £229,562.

NEW COMPANIES

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

L. C. Abdale Building Contractors, Ltd. (584210.) Regd. May 20. Weir-st., Darlington. Nom. cap.: £2,000. Dir.: L. C. Abdale.

Site Preparations, Ltd. (584214.) Regd. May 20. 20, Berry-rd., Saltley, Birmingham. Civil engrs. and contrs. Nom. cap.: £100. Dir.: L. Whiles.

W. E. & T. A. Thomas, Ltd. (584309.) Regd. May 21. Ty Newydd, Waenfawr. Bldrs. Nom. cap.: £100. Dir.: W. E. Thomas.

Horton (Brockham), Ltd. (584321.) Regd. May 21. 124, High-st., Dorking. Bldrs. Nom. cap.: £1,000. Dir.: R. T. Horton.

Industrial Development and Construction, Ltd. (584323.) Regd. May 21. Designers and constructors of industrial bldgs., etc. Nom. cap.: £500. Sub.: Mary Fisher, 9, Lochaker-st., Cardiff (clk.).

Pinchbeck Building Co., Ltd. (584347.) Regd. May 21. Pennytoft-la., Pinchbeck, Spalding, Lincs. Nom. cap.: £1,000. Dir.: A. D. Boor.

Albert Penny & Sons, Ltd. (584351.) Regd. May 22. 67, Colenso-rd., Blackburn. Bldrs. Nom. cap.: £1,000. Permt. dir.: W. N. Penny.

Span-Cambridge (Development), Ltd. (584379). Regd. May 22. 2, Finchley-rd., NW8. Housing and bldg estate developers, etc. Nom. cap.: £10,000. Dir.: L. Bilsby.

F. R. Price, Ltd. (584361.) Regd. May 22. 47, Beckman-rd., Pedmore, Stourbridge, Worcs. Bldrs. Nom. cap.: £1,500. Dir.: F. R. Price.

G. S. Hallum & Sons. (584388.) Regd. May 22. 9, Carlton-cres., Southampton. Bldrs. Nom. cap.: £3,500. Dir.: D. C. Hallum.

Stretton Bros. (Contractors), Ltd. (584394.) Regd. May 22. 27, Bouverie-sq., Folkestone. Bldrs. contrs. Nom. cap.: £2,000. Dir.: R. D. Stretton.

Murrey & Gaymer, Ltd. (584442.) Regd. May 23. 2, Endsleigh-st., WC1. Bldg. contrs. Nom. cap.: £100. Dir.: H. W. Gaymer.

Suiter Bros., Ltd. (584453.) Regd. May 23. 28, King-st., King's Lynn, Norfolk, Bldrs. Nom. cap.: £100. Permt. dir.: T. W. Suiter.

W. J. Frost (Weston) Builders, Ltd. (584460.) Regd. May 23. 34, Sommerville-rd., St. Andrews, Bristol. Nom. cap.: £10,000. Dir.: W. J. Frost.

A. O. Crowther, Ltd. (584478.) Regd. May 24. 253/255, Saddleworth-rd., Greetland, nr. Halifax. Bldrs. Nom. cap.: £5,000. Dir.: A. O. Crowther.

Edward & John Brown (Contractors), Ltd. (584495.) Regd. May 24. 219, Lawley-st., Birmingham, 4. Bldrs. and contrs. Nom. cap.: £1,000. Dir.: E. Brown.

Flynn Brothers (Contractors), Ltd. (584576.) Regd. May 27. 12, Ashton Old-rd., Ardwick, Manchester, 12. Nom. cap.: £5,000. Bldrs. and contrs. Dir.: M. Flynn.

G. E. Mellor (Brighouse), Ltd. (584580.) Regd. May 27. 135, Bradford-rd., Brighouse, Yorks., Bldr., etc. Nom. cap.: £4,000. Dir.: G. E. Mellor.

Hellard Bros., Ltd. (584585.) Regd. May 27. Bathway, Chewton Mendip, Som. Bldrs. Nom. cap.: £1,000. Dir.: T. R. Hellard.

A. Richards (Builders), Ltd. (584618.) Regd. May 27. National Employers House, Quebec-st., Leeds, 1. Nom. cap.: £1,000. Sub.: D. Frudd.

Denrite (Morecambe), Ltd. (584624.) Regd. May 27. 54, Rylstone-dr., Morecambe and Heysham. Bldrs. Nom. cap.: £2,000. Dir.: R. M. Helmn.

A. B. Bryant (Builders), Ltd. (584641.) Regd. May 28. 106, High-st., Billericay, Essex. Nom. cap.: £100. Sub.: Mrs. D. G. Bryant.

Constructions (Accrington), Ltd. (584650.) Regd. May 28. 4, Whalley-rd., Accrington. Erection, construction, and finishing of bldgs., etc. Nom. cap.: £500. Sub.: R. Knowles.

R. Knowles (Accrington), Ltd. (584667.) Regd. May 28. 406, Manchester-rd., Baxenden, Lancs. Bldrs. Nom. cap.: £500. Dir.: R. Knowles.

T. C. J. Ltd. (584669.) Regd. May 28. 237, Springbank-rd., Hither Green-la., S.E.13. Bldrs. Nom. cap.: £100. Dir.: T. C. Jeffrey.

F. E. Tibble & Sons, Ltd. (584687.) Regd. May 27. 141, Sheen-la., SW14. Bldrs. Nom. cap.: £1,500. Dir.: F. E. Tibble.

G. Banks, Ltd. (584689.) Regd. May 28. 665, Attercliffe-common, Sheffield, 9. Bldr., etc. Nom. cap.: £6,000. Dir.: G. Banks.

Leslie, Hawkins (Builders), Ltd. (584694.) Regd. May 28. Peel-st., Kensington, W8. Nom. cap.: £100. Dir.: F. G. Hawkins.

P. G. Oxley, Ltd. (584699.) Regd. May 28. 47, High-st., Walton-on-the-Naze, Essex. Bldr., etc. Nom. cap.: £2,000. Dir.: W. J. Oxley.

A. E. Lewis & Son, Ltd. (584746.) Regd. May 29. 47, Oxford-st., W1. Bldrs. Nom. cap.: £5,000. Dir.: F. W. Lewis.

Alfred Cox (Builders), Ltd. (584747.) Regd. May 29. Nom. cap.: £10,000. Sub.: A. Cox, 225, Oxclose-la., Arnold, Nottingham.

The Builder FUTURE CONSTRUCTION

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

AUGUST 20.

***†Plymouth City.**—228 dwellings Southway estate and alterations to Whitleigh Church House, Whitleigh. City A. Dep. £3 3s. each.

†Wakefield City C.—40 one-bedroomed flats at Clarion-st. City E. Tenders by September 10.

AUGUST 21.

***†Newcastle Regional Hospital Board.**—Operating suite, South Shields General Hospital. Sec., Benfield-rd., Newcastle-upon-Tyne, 6.

AUGUST 22.

***†Ipswich CB.**—22 houses Chantry estate 2B. BE&S. Dep. £3 3s. Tenders by September 26.

***†Surrey CC.**—New county primary school, Milford, near Guildford. County A, Kingston.

***†Surrey CC.**—County primary school, Chobham-rd., Camberley. County A, Kingston.

***†Surrey CC.**—Extension Merton and Morden, Raynes Park County Grammar Boys' school. County A, Kingston.

***†Surrey CC.**—Extensions Roval Grammar school, Guildford. County A, Kingston.

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***†Surrey CC.**—Extension Riddlesdown County secondary school, Coulsdon and Purley. County A, Kingston-on-Thames.

AUGUST 23.

***†Hitchin UDC.**—58 houses, Westhill estate, S. Dep. £3 3s. Tenders by Sept. 20.

AUGUST 24.

***†Essex CC.**—Two cottages, Essex Institute of Agriculture, Writtle. H. Conolly (F), County A, Chelmsford.

***†Hastings Corporation.**—Aged people's home. BE. Dep. £2 2s.

AUGUST 26.

***†Chigwell UDC.**—Reconditioning 8 cottages, Gladstone-rd., Buckhurst Hill. Tooley & Foster, architects, Midland Bank-chambers, Buckhurst Hill.

***†Northampton CB.**—43 houses and 12 flats, Kings Heath. Boro A. Dep. £2 2s. Tenders by September 16.

***Tottenham BC.**—34 additional stores, Tewkesbury estate. BE. Dep. £1 1s.

AUGUST 28.

***†Norfolk EC.**—Branch library, Attleborough, and extensions at Upwell secondary modern school. F. Lincoln Ralph, Chief Education Officer, Norwich.

AUGUST 29.

***†Bromley BC.**—27 flats, Palace-rd. and Wharton-rd. BE. Dep. £2 2s.

***†Leeds Regional Hospital Board.**—Extensions Eskdale hospital, Whitby. A to Board, Park-parade, Harrogate. Dep. £2 2s.

***†West Sussex CC.**—Secondary modern school, Lancing. County A, Chichester.

AUGUST 30.

***†Kingston-on-Thames BC.**—6 flats, Auckland-rd. TC. Dep. £2 2s.

†Rotherham CBC.—Erection of Old Hall sec. sch., Kimberworth, Rotherham, in Derwent construction. £150,000 est. Director of Education. Dep. £5 5s.

AUGUST 31.

***Exeter City.**—New Hele's secondary grammar school for boys, Southam. H. B. Rowe (F), City A. Dep. £5 5s.

***†West Sussex CC.**—Extension Horsham Greenway primary school and Crawley Ifield secondary modern school. County A, Chichester.

SEPTEMBER 2.

***†Anglesey CC.**—Fire headquarters, clinic and ambulance station, Llangefni. County A, Llangefni. Dep. £2 2s. Tenders by Sept. 25.

Knaresborough UDC.—(1) 100 Unity dwellings and community block. (2) Roads and sewers, at Charlton Manor estate. Either or both E&S. Dep. £2 2s. each contract.

Montgomeryshire CC.—New sec. mod. sch. at Welshpool. Director of Education. Dep. £2 2s.

Rochdale CBC.—20 dwellings and 4 garages at Holstein-avenue estate. Boro' S. Dep. £2 2s.

Shrewsbury BC.— Completion of new Smithfield. Boro' S. Dep. £2 2s.

Watford RDC.—Six bungalows, six houses, 16 one-room flats in four blocks of four, at Gill's Hill-la., Radlett. C. Dep. £1 1s.

SEPTEMBER 3.

***Mansfield BC.**—Alterations at public swimming baths, Bath-st. BE&S. Dep. £2 2s.

SEPTEMBER 4.

***East Riding CC.**—Fire station, Withernsea. County A, Beverley. Dep. £2.

SEPTEMBER 5.

Eston UDC.—Four contracts: (1) 20 houses, (2) 10 houses, (3) 28 houses, (4) 54 houses, at Teesville East estate, Normanby. E&S. Dep. £1 1s. each contract.

SEPTEMBER 6.

***Frome UDC.**—10 garages Rodden-rd. estate. S.

***Kingston-on-Thames BC.**—Veterinary surgery, Bath Passage. BS. Dep. £2 2s.

***Portsmouth City.**—Kiosks and booking offices, South Parade, Southsea; 130 houses, Leigh Park; 45 flats, Eastern-rd.; 18 flats, Nelson-rd. and 25 flats, Southsea. City A, 1, Western-parade. Dep. £1 each.

SEPTEMBER 7.

Brighton CBC.—Old folks' home at Craven Vale. Boro' S. E&Planning Officer. Dep. £2 2s.

***Reigate BC.**—Alterations Old Fire Station and Town Hall, Castlefield-rd. G. G. Sanderson. BE&S.

SEPTEMBER 9.

***Andover BC.**—12 bungalows, Vigo-rd. BS. Dep. £2 2s.

***Wallasey CB.**—10 shops with 17 maisonettes; 20 houses and 7 garages, Leasowe estate, Twickenham-dr. Boro' A.

SEPTEMBER 11.

***Chelmsford BC.**—Five bungalows, Springfield-rd. BE&S. Dep. £2 2s.

***Stourbridge BC.**—Six shops, six maisonettes, nine flats, nine lock-up garages and incidental siteworks at Wollaston Farm estate. BE&S. Dep. £3 3s.

SEPTEMBER 14.

***Merioneth EC.**—Extension grammar sch., Towyn. County A, Dolgelley. Dep. £3 3s.

SEPTEMBER 18.

***Mansfield BC.**—24 flats, Ladybrook housing estate. BE&S. Dep. £2 2s.

OCTOBER 10.

***Maidenhead BC.**—38 houses, Spencers estate. BE&S. 14, Cranford-rise. Dep. £2 2s.

MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

AUGUST 26.

***East Riding CC.**—Development of playing fields, Hessle High school. County A, Beverley. Dep. £2.

AUGUST 27.

Inverness CC.—Intake works, filters, storage tank, and excavation of tracks for 6¼ miles of 3 in. and 2 in. dia. asbestos-cement pipes and specials at Braes; also collecting chamber, pumphouse and storage tank and similar pipeworks for ¾ mile of 2 in. dia. asbestos-cement piping at Penifiler, nr. Portree, Skye.

Warrington CBC.—1,200 lin. yd. of roads and 2,000 lin. yd. of foul and SW sewers and drains, 36 in. to 6 in. dia., manholes, etc. Boro' S. Dep. £2 2s.

AUGUST 31.

Banstead UDC.—Road works. E&S. Dep. £2 2s.

West Kesteven RDC.—2,000 yd. of 6 in. and 9 in. dia. pipe sewers, pumping station and sewage disposal works at Great Ponton, nr. Grantham. Elliott & Brown, Ccl's. constg. engrs., Stanley-hse., Pelham-rd., Nottingham. Dep. £5 5s.

SEPTEMBER 2.

Manchester CC.—12,600 sq. yd. bitumen macadam carriageway, 2,680 lin. yd. of 6 in. to 18 in. dia. sewer, etc. City S.

SEPTEMBER 3.

Clacton UDC.—817 lin. yd. of 6 in. to 12 in. dia. concrete pipe SW sewer and 9,585 sq. yd. of 7 in. thick r.c. carriageway 30 ft. wide, footways, etc., at King's parade, Holland-on-Sea. E&S. Dep. £2 2s.

SEPTEMBER 4.

Ashby-de-la-Zouch RDC.—3,400 yd. of 6 in. to 12 in. dia. glazed stoneware and CI foul sewers, manholes and house connections, 600 yd. of 5 in. dia. CI pumping main and pumping station for Packington parish. Pick, Everard, Keay & Gimson, engrs., 6, Millstone-la., Leicester. Dep. £2 2s.

SEPTEMBER 5.

Kidderminster BC.—Making-up of streets. Boro' E&S. Dep. £3 3s.

"THE BUILDER" PRICES

Block and Sawn Stone

Portland Stone—The Bath and Portland Stone Firms, Ltd., announce that while it is possible to absorb increased wage costs in the winning of Portland block stone and thus to maintain the present selling price, the price of sawn Portland stone will be increased by 5 per cent as from September 1 next.

Bath and Doulting Stone—The following increases in the prices of Bath and Doulting stone will also come into effect as from September 1:

	Increase per ft. cu. s. d.	New Price per ft. cu. s. d. ex quarry
Box Ground and Park Lane stone	1 0	7 7
Hartham Park and Monks Park stone	9	6 4
Doulting stone ...	9	6 10

In addition to the above block stone increases, the Bath and Portland Stone Firms also announce that it has been found necessary to raise the price of sawn Bath and Doulting stones. New prices will be quoted on application.

Walton and Weybridge UDC.—Completion of roadworks (1,000 lin. yd.) at Hersham-rd. housing estate. E&S.

SEPTEMBER 9.

Bath Corpn.—Reconstruction of part of bypass channel and investigation of clay puddle core, etc., at Monkswood reservoir, Batheaston. A. P. I. Cotterell & Son, engrs., 54, Victoria-st., SW1. Dep. £3 3s.

SEPTEMBER 10.

Devizes RDC.—3,800 lin. yd. of 12 in. to 6 in. sewers and sewage disposal works for 600 persons at Urchfont. Harvey, McGill & Hayes, Ccl's. constg. engrs., 38, Market-place, Chippenham, Wilts. Dep. £5.

SEPTEMBER 11.

Bournemouth CBC.—Reconstruction in r.c. of Boscombe Pier neck (500 ft. by 30 ft.) incl. pile driving, jarrah timber deck, repairs and additions to pierhead and extensions to outfall sewer. Boro' E. Dep. £1 1s.

SEPTEMBER 16.

Tees Valley Water Board.—(1) 8,550 yd. of 33 in. dia. steel main between Long Newton reservoir and River Tees, nr. Eaglescliffe; (2) 6,557 yd. of 33 in. dia. steel main between River Tees, nr. Eaglescliffe and site of proposed reservoir at Hemlington, nr. Middlesbrough. E&Gen. Mgr. Dep. £3 3s. each contract.

SEPTEMBER 19.

Bedford RDC.—Eaton Socon drainage—pumping station, 7,000 lin. yd. 7 in. to 12 in. dia. concrete pipe and stoneware drains, with manholes, etc., and 1,600 lin. yd. of 9 in. iron pumping main. John Taylor & Sons, Ccl's. constg. engrs., Artillery-hse., Artillery-row, SW1. Dep. £5.

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GENERAL BUILDING WORK

(LONDON)

Beckenham.—FLATS.—The BC is to acquire by compulsory purchase an area of land at Woodland-way, West Wickham, to enable it to adapt an existing house and to build three other houses to provide 18 flats for elderly people. The Boro' E&S is J. Dove, AMICE, MIMunE.

Deptford.—FLATLETS.—The Housing Com. has approved a scheme prepared by the Boro' Engineer, R. C. Smith, AMICE, ARICS, MIMunE, for six two-storey flatlets for aged persons.

Deptford.—DWELLINGS.—The Housing Com. has decided that the next stage in its housing programme shall be the construction of three blocks (E, F and G) at the Brockley-rd./Wickham-rd. site, comprising 72 dwellings. This will be followed by the building of 12 dwellings on the Wickham-rd./Ashby-rd. site, 38 on sites at Dennetts-rd. and Dennetts-rd./Walsham-rd., and the remaining four blocks (D, C, H and J), comprising 76 dwellings, at the Brockley-rd./Wickham-rd. site. The architects for these schemes are H. V. Ashley & Winton Newman (L/F), 3, Verulam-bldgs., Gray's Inn, WC1, and the quantity surveyors are Frank N. Faulkner & Ptnrs., 39, Bedford-sq., WC1.

Ealing.—SCHOOL.—The Middlesex Education Com. proposes the erection of a new school, to be known as Ealing, Northolt Park (Petts Hill), infants' school, on a site of 1.6 acres at Newmarket-av. The estimated cost of the building works is £47,570.

Heston and Isleworth.—SCHOOL.—Subject to necessary consents, the Middlesex CC has approved the expenditure of £37,535 on a special training school for 80 mental defectives at Bridge-rd., Isleworth, to replace the Brentford special training school.

St. Marylebone.—POLICE STATION.—The MBC offers no objection to a proposal for a new police station on a site bounded by Bryanston-st. and Seymour-st. The scheme is in a very early stage.

Southwark.—CHURCH.—The war-damaged Metropolitan Tabernacle, known as Spurgeon's Tabernacle, is to be rebuilt on its old site at Newington Butts at an estimated cost of £200,000. In addition to the church, which will seat 1,700, there will be two main halls, classrooms and offices. The architects are R. Mountford Pigott & Ptnrs. (F/A), 3, Cromwell-pl., SW7, and the quantity surveyors are L. A. Francis & Sons, Vernon-hse., Sicilian-av., WC1.

Westminster.—CONCERT HALL.—Plans to convert the bombed church of St. John, Smith-sq., into a concert hall to seat 1,500 people are under discussion between the church authorities and the company, St. John's, Smith Square, Preservation, Ltd., formed for the purpose. The architect, Louis Osman (F), 9, Barton-st., SW1, estimates the cost of conversion at £250,000.

(PROVINCIAL)

Accrington.—Lancs EC approved erection of first phase of Holy Family RC sec. sch., £127,245 est. A: Arthur Farebrother & Ptnrs. (A), 99, Seymour-gr., Trafford Bar, Manchester.

Amble, Northumberland.—UDC Surveyor (T. B. Adamson) has prepared plans for 37 houses at Links estate. No contracts let.

Atherton.—UDC proposes 18 bungalows and community centre at Devonshire-pl., £26,535 est.

Barnard Castle.—UDC Works Com. has approved plans for layout and development of Bridgegate and Thorngate Wynd and the erection of five blocks of semi-detached houses and flats.

Birkenhead.—Methodist Authorities propose erection of new church at Woodchurch estate.—TC seeks loan £181,215 for 105 dwellings at Overchurch estate.

Birmingham.—W. S. Hattrell & Ptnrs. (F/A), 1a, Queen's-rd., Coventry, are A for new theatre to seat 1,900-2,000 to replace old Theatre Royal on island site at Smallbrook-st., for Moss Empires, Ltd.

Birmingham.—Norwich Union Life Insurance Society is to erect seven-storey building with shops on ground floor and offices and warehouse accommodation above at Smallbrook-st., fronting Inner Ring-rd., £750,000 est.

Bishop Auckland.—Twelve police houses to be built at Woodhouse-close estate for Durham CC. County A: G. R. Clayton (F), South-st., Durham.

Blackburn.—RC Authorities propose conversion of Beardwood Hall into private hospital. A: Charles E. Jackson (L), 73, Harrington-ave., Blackpool.

Blackpool.—EC proposes erection of school for sub-normal children off Woodland-gr.

Blackpool.—TC decided that 70-acre site at north of town is to be laid out for corporation houses.

Boldon, Co. Durham.—NCB to erect large area headquarters at Mill-la., Whitburn. Board's A Dept., Ashfield Towers, Gosforth, Newcastle-on-Tyne. Inquiry to be held on September 11 by MH&LG into UDC's rejection of plans for 66 houses at Cleadon for H. Chapman & Son, accountants, Barrington-st., South Shields.—Wilkinson Bros., High-st., Gateshead, to erect 24 houses at Woodlands-rd., Cleadon.—A. R. Cowell, builder, Newcastle-rd., Sunderland, to erect 12 houses at Woodlands-rd., Cleadon.—J. Prentice, builder, Leeds-st., Sunderland, to erect 16 houses at Bransdale-ave. and Farndale-ave., South Bents, Whitburn.

Border.—RDC proposes 70 houses at Longtown and 20 at Brampton.

Cambridge.—CC approved in principle preliminary plans for new fire station at Parkside, £150,000 est.

Chester.—TC proposes 15 shops at Newton Hall estate.

Chesterfield.—Methodist Authorities propose erection of new hall and ancillary rooms at Ulverston-rd., Newbold estate, £14,000 est.

Chesterfield.—TC proposes erection of new swimming baths nr. town centre.

Chorley.—TC approved layout for 43 houses on Princess-st. site.

Church.—UDC proposes establishment of central shopping area at Edward-st., Bank-st. and Henry-st.

Clayton-le-Moors.—UDC proposes erection of new council offices. Scheme in preliminary stages.

Colwyn Bay.—Denbighshire CC proposes extensions to grammar sch.

Conway.—Caernarvonshire EC received Ministry approval for 1st instalment of new sec. sch., £100,000 est.

Coventry.—Work to commence next year on new C of E comprehensive sch. for Rev. E. W. Jones, St. Peter's Church, Hillfields, Coventry.

Cumberland.—CC to spend £11,000 on combined library and clinic at Seascale. County A: J. H. Haughan (F), Portland-sq., Carlisle.

Derby.—The Kenning Group of Companies, Queen-st., propose erection of extensive new depot including showrooms, offices, stores and service department.

Durham.—Sketch plans have been approved for new fire station at Consett for CC and quantities are to be prepared. County A: G. R. Clayton (F), South-st., Durham.

Gateshead.—R. Collins (A), AMTPI, St. Hilda-st., South Shields, is A for proposed erection of machine shop at Coulthards-la. for Armstrong Whitworth & Co. (Metal Industries), Ltd. No contracts let.

Gateshead.—Eltringham & Lowes (A), Derwent-st., Blackhill, Co. Durham, are A for proposed shop and warehouse at High-st. for Reuben Bros.

Godalming.—TC proposes four-storey block of flats, with garages and storerooms at street level, on site of 12-17, Latimer-road, and is to invite tenders from Reema Construction, Ltd., and from local contractors for 'new traditional' and traditional type buildings, respectively. Boro' S & Housing A: W. S. Mercer (L), FRICS, MIMunE.

Gosforth.—UDC approved plans for sec. mod. sch. at Harewood-rd. for Northumberland CC. County A: C. C. Brown (A), County Hall, Newcastle-on-Tyne.

Houghton-le-Spring.—M of W expects to start work in October on new Post Office at Newbottle-st.

Hyde.—Cheshire EC proposes new College of Further Education adjoining Bowlacre, Hilda-rd., off Stockport-rd., £400,000 est.

Jarrow-on-Tyne.—TC is considering erection of 50 houses in the overspill area and work expected to start in autumn. Detailed plans to be prepared for erecting houses in Stead-st. and Queen's-rd. areas. Provision will be made for 446 houses in two-, three- and four-storey buildings.—Wilkinson Bros., High-st., Gateshead, are planning erection of about 30 houses at Elmfield, Monkton.

Keighley.—TC approved plans for new factory, offices and canteen at Dalton-la. for Keighley Lifts, Ltd.

Keswick.—UDC is to carry out sewage disposal scheme est. to cost £80,000.

Kirkby-in-Ashfield.—UDC proposes 54 houses and 12 blocks of flats at Kingsway estate.

Lancs.—CC proposes new school clinics and child welfare centres at Bacup, Ormskirk and Kirkby in 1958/9 programme.

Lancs.—CC to give high priority to erection of libraries at following places:—Abram, Adlington, Audenshaw, Brierfield, Culcheth, Formby, Grange-over-Sands, Great Sankey and Penketh, Horwich (Chorley New-rd.), Huyton (St. John's Estate East), Leyland, Morecambe, Mossley, Poulton, Prestwich (Brooklands), Skelmersdale, Turton (Eagley), Urmston (Davyhulme), Walton-le-Dale (Tardygate), Whiston, Worsley (Little Hulton), and extensions at Prestwich (St. Mary's).

London (British Transport Commission).—Improvements to two waterways are proposed, as follows:—Aire and Calder Navigation: Bank protection and navigation works, £591,500; mechanisation of locks, £70,000; dredging plant, etc., £67,000; workshops and other premises, £226,500. Sheffield and South Yorkshire Navigation: Bank protection and navigation works, £369,000; mechanisation of locks, £15,000; dredging plant, etc., £209,250.

Lunesdale.—RDC proposes erection of 4 aged persons' bungalows at Beckside Caton. A: Charles B. Pearson & Son (F), 18, Dalton-sq., Lancaster.

Macclesfield.—BC proposes erection of further 700 houses at Hurdsfield estate during next five years.

Manchester.—Erection of pressroom and mill building to rubber factory proposed at Dantzic-st., Bilberry-st. and Bromley-st. for Phillips Rubber Manufacturing Co., Ltd. A: Cruickshank & Seward (F), 196, Deansgate.—Extensive new office block proposed at Corporation-st., Miller-st., Amber-st., North-st. and Hanover-st. for Co-operative Insurance Socy., Ltd. Plans by CWS A. Dept., 1, Balloon-st., Manchester.

Manchester.—TC approved erection of following aged persons' dwellings: 2 at Lowther-ave., Gorton; 9 at Wayland-rd., Gorton; 16 at Darras-rd., Cleadon-ave. and Buckley-rd., Gorton; 9 at Oldcastle-ave., Withington; 20 at Tabley-ave., Comstall-ave., Holford-ave. and Bredbury-rd., Rusholme; 8 at Buckley-rd. and Aylesby-ave., Gorton; 18 at Rosevale-ave., Burnage; 3 at Hemsworth-rd., Gorton, and 5 houses at Mottershead-rd., Sharston, Wythenshawe.

Middlesbrough.—Plans prepared by Brierley Syme & Leckenby (F/F), 10, Lendal, York, for proposed alterations and additions to Midland Bank, Marton-rd., Middlesbrough.—Office extensions proposed at Southfield-rd. for E. Upton & Sons. A: T. A. Crawford (L), 80, Borough-rd., Middlesbrough.—Boro' E. J. A. Kenyon, has prepared plans for three-storey block of flats at Stockton-st, and three- and four-storey flats in East-st./Graham-st. redevelopment area.

Middlesbrough.—TC to give further consideration to scheme to build typography block at new College of Art, £30,000 est.

Morecambe.—BC proposes 30 aged persons' bungalows at Lowlands-rd.

Morpeth.—Morpeth RDC has approved plans for 13 houses and roads at Widdrington. S: J. R. Miles.

Newcastle-on-Tyne.—Additional storey to be added to north and centre block at King's College to provide accommodation for 431 medical students. A: W. B. Edwards & Ptnrs. (F/A), Eldon-pl., Newcastle.

Newcastle-on-Tyne. — EC's building programme for 1958-9 is expected to include £90,000 for additions to Heaton boys' and girls' high schools. City A: G. Kenyon (A), AMTPI, 18, Cloth-market, Newcastle.

Newcastle-on-Tyne. — Multi-storey garage proposed at Picton-terr. for Straker (Newcastle), Ltd., motor car dealers. A: Percy L. Browne, Son & Harding (F/F), Pearl-bldgs., Northumberland-st., Newcastle.

Newcastle-on-Tyne.—Plans approved for RC sec. mod. sch. at Kenton. A: Reavell, Cahill & Cahill (F/F), Lloyds Bank-chbrs., Alnwick. —City A. G. Kenyon, 18, Cloth Market, Newcastle, has prepared plans for five-storey block of dwellings (18 tenancies) at Church-st. for City C.

Northumberland.—Home Office has approved erection of fire station at Belford, £10,000 est. County A: C. C. Brown (A), County Hall, Newcastle-on-Tyne.—Ccl. is urging Ministry to sanction start on welfare home at Blyth and proposed 60-bed extension at Thomas Taylor Homes, Stannington.—M of E has refused permission to EC to spend £167,000 on improvements to Bellingham and Marton school camps, but has authorised spending of £10,000 on repairs to each camp.—EC's building programme for current year has been amended to include Haltwhistle county mod. sch. (£99,000), remodelling of Alnwick Duke's grammar sch. (£53,000), and Morpeth Spelvit-la. county infants' sch. (£23,000). Programme for 1958-59 is expected to include sec. schools at Newburn (£148,000), Haydon Bridge (£108,000), and North Sunderland (£48,000), and RC prim. sch. at Longbenton (£96,000).—Road reconstruction scheme is planned at Weldon Bridge, £118,000 est.

Northumberland.—CC is considering an eight acres site for new county offices. Location of site not disclosed, but District Valuer has been asked to negotiate for its acquisition.

Northumberland.—CC to spend £12,000 on central stores at police headquarters at Morpeth, and £10,000 on two police section stations at Newbiggin and Rothbury. No contracts let. County A: C. C. Brown (A), County Hall, Newcastle-on-Tyne.

Nottingham.—TC proposes erection of branch library at Clifton estate, £25,000 est.

Nottinghamshire.—MoE has approved proposals to build 11 schools, est. to cost £1,075,000, at Arnold, West Bridgford, Worksop, Harworth, Newark, Retford, Mansfield Woodhouse and Blidworth.—CC to build 16 houses for teachers at Calverton, East Leake, Harworth Eastwood, Blyth, Southwell and Carlton-in-Lindrick, and centre for training of blind, deaf, dumb and other handicapped people at Dallas-st., Mansfield.

Ormskirk.—BC approved plans for offices, stores canteen and toilet accommodation at County-rd. for K. P. Piggott.

Penrith.—UDC to prepare plans for 16 aged persons' dwellings at Elm-ter.

Richmond, Yorks.—M of E approved plans for new school buildings and extensions at grammar sch. County A.

Rishton.—UDC proposes erection of new council offices and assembly hall.

Rochdale.—TC proposes erection of 25 houses at Mansfield-rd.; proposes carrying out alterations at Brown Hill open-air sch., £30,000 est.

Salford.—RC Diocese of Salford proposes erection of new church and presbytery between Northallerton-rd. and Mervyn-rd., Broughton.

Scarborough.—G. W. Alderson (A), Pavilion-terr., Scarborough, has prepared revised plans for two blocks of flats at Seacliffe-rd. for A. Moore & Son, builders, Seamer-rd., Scarborough.

Seaham.—F. W. Rought & Son, builders, Woolsington Garden estate, Newcastle-on-Tyne, to erect 26 houses at Mount Pleasant estate.

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Sedgefield.—RDC has approved development scheme for Windlestone to include 142 houses for miners and sites for school, shops and light industry. S: J. Tarran.

Sheffield.—SPD, Ltd., London, propose erection of new distribution depot at Dronsfield. Constg. engrs.: F. S. Snow & Ptnrs., Monro-bldg., Wellington-st., WC2.

Shrewsbury.—Shrewsbury and Minsterley branch of the National Farmers' Union propose erection of three-storey office block at Barker-st.

Southport.—TC approved layout for 15 houses at Westcliffe-rd., Birkdale.

South Shields.—Plans approved for alterations and additions to 'Look Out' inn, Fort-st. for W. Younger & Co., Ltd. A: D. H. White (L), 29, Clifton-ave., Eaglescliffe, Stockton-on-Tees.

South Shields.—Elsey & Gibbons, Ltd., Maxwell-st., propose to build additional factory. —F. L. Hall & Co., timber merchants, have received permission to build canteen, sawmill, office and garage.

South Shields.—TC is seeking permission to proceed with £40,000 scheme for extensions to Corporation transport depot.—EC proposes further additions to Cleadon Park county sec. sch. A: T. A. Page, Son & Hill (F/F), 75, King-st., South Shields. QS: R. S. Malloch, 6, Eldon-sq., Newcastle-on-Tyne.—Plans by S. W. Milburn & Ptnrs. (F/F), 9, Esplanade, Sunderland, for operating theatre suite at General Hospital have been approved.

Spennymoor.—New RC church proposed.—UDC approved plans for 18 bungalows and two blocks of single person flats at Middlestone Moor. Ccl's A: G. H. Gray (F), Camden-st., North Shields.

Spennymoor.—Vaux & Associated Breweries, Ltd., Sunderland, have received Ministry sanction to building of new licensed premises at Black-rd., Spennymoor. Staff A.

Stafford.—TC proposes erection of infant welfare clinics at Rising Brook.

Staveley, Derbys.—UDC propose further 116 houses on Inkersall Green estate.

Stockton-on-Tees.—Additions are proposed to William Newton sec. girls' sch. for EC. Boro' A: T. S. Hartley (A), 28, The Square, Stockton.

Stowmarket.—ICI Paints Division to provide 275,000 sq. ft. additional floor space at factory, together with warehouse, administrative offices and amenities, covering further 21 acres.

Sunderland.—Site of two acres at Hylton Castle estate to be appropriated for purposes of community centre.

Sutton Coldfield.—Erection of new factory at Coleshill-st. for E. H. Derricott, Ltd. A: McKewan & McKewan, 318, Hamstead-rd., Handsworth, Birmingham.

Tipton.—Staffs CC proposes infant welfare centre at Birch-st., £12,000 est.

Tow Law, Co. Durham.—UDC is negotiating for purchase of land at North Cottages on which to erect 28 houses.

Tynemouth.—TC has received sanction from Home Office to building of new police station, £100,000 est.

Tynemouth.—S. Storer, builder, Langley-rd., North Shields, has appealed to MH&LG against TC's refusal to sanction erection of bungalows on site at Kennersdene Park estate.

Tynemouth.—North Shields Co-op. Socy., Ltd., 8, Camden-st., North Shields, to erect fruit warehouse in Vicarage-st. area and have received outline approval from local authority. No architects yet appointed.

Up Holland.—UDC proposes adaptation of 'The Hall Green' to form new Council offices. Plans by S: J. T. Iball.

Uttoxeter.—UDC to prepare plans for erection of 5 shops at Weaver Lodge estate.

Walton-le-Dale.—Lancs CC proposes erection of library at Brownedge-la., Bamber Bridge.

Warrington.—Atomic Energy Authority to construct new hostel and recreation grounds on site of former Admiralty Camp at Newchurch.

Warrington.—EC proposes three new classrooms at Orford C of E sch.

Warrington, Lancs.—Work is to commence in September on new RC church of St. Catherine of Siena at Lane Head, Lowton.

Wellington.—Central Electricity Authority propose erection of new office and canteen block at Shifnal-rd., Ketley.

Whitley Bay.—Waterford Social Club, Seaton Sluice, has bought old premises, which are to be converted into club. First stage of scheme will cost £20,000 and work will begin as soon as possible. No detailed plans prepared.—Wimpey & Co., Ltd., Orchard-hse., Fenwick-ter., Newcastle-on-Tyne, to erect 33 houses at Hartley East Farm.—William Stockdale (F), 73, Howard-st., North Shields, has prepared layout plans for roads and sewers to serve 120 houses to be built by private builders at Monkseaton building estate.

Whitley Bay.—Northumberland CC to submit £103,000 scheme for improvements to Marden-rd. bridge, Whitley Bay, to M of T, and about £65,000 for approach road works. Plans by County S, Phœnix-hse., Queen-st., Newcastle-on-Tyne.

Wigan.—RDC proposes 18 bungalows at Stoney Gate-la., Wrightington; 6 blocks of houses and 2 blocks of flats at Gathurst-la., Shevington, and 4 aged persons' bungalows at Beech-ave., Parbold.

Wigan.—St. Patrick's RC Church proposes new church and presbytery at junction of Lamb-st. and Moore-st., Whelley.

Wolverhampton.—TC approved erection of new factory and offices at Ablow-st. and Cross-st. for Ablow Industrial Plating Co., Ltd. A: Jennings, Homer & Lynch, 3, Church-st., Brierley Hill.

Workington.—Fischer & Porter, Ltd., propose extensions to their factory at Moorclose-rd. A: Ronald Ward & Ptnrs. (F/A), 29, Chesham-pl., SW1.

Worthing.—HC approved layout of 64 houses at extension to The Strand, and new road entering Limbrick-la., Goring.

Wrexham.—BC approved proposals for building 70 houses on six-acre site bounded by Whitegate-la., Gwenfro river, railway line and new road off Queensway, Queen's Park. E&S: J. M. Davies.

TENDERS

* Denotes *accepted*.
† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H.M. Government Departments*.

Arnold.—12 flats at Cross-st. for UDC. *Gregory Housing, Ltd., Worthing, Sussex, £17,130.

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Barnard Castle.—36 houses and flats at Shirley-cl., Evenwood, for RDC. A: J. Lawton (A), 45, Galgate, Barnard Castle. *W. Stobart, Billy Hill, Crook, Co. Durham.

Bath.—Works for City C at Twerton/Whiteway estate. City Planning Officer and A: J. G. Wilkinson, B'Arch. (A), AMTPI. QS: Nixey & Jordan, F/ARICS, 18, Charles-st., Bath. Stage 1A (40 dwellings), *Edward J. White (Builders), Ltd., 595, Gloucester-rd., Bristol, 7, £61,750 (fixed price).—Stage 1B (59 dwellings and 16 garages), *E. Mortimer & Son, Ltd., High-st., Weston, Bath, £118,276 (fixed price).

Carlisle.—New office block and warehouse at King-st. and Lancaster-st. for Risley Wholesale Chemists, Ltd. *J. Millar & Sons, 15, London-rd., Carlisle.

Chester.—New Blacon Community Centre for EC. *Lloyd & Cross, Ltd., Argyle-st., Birkenhead, £10,389. 36 flats, 16 bungalows and 112 houses at Newton Hall estate for TC. *Thos. Warrington & Sons, Ltd., Ellesmere Port.

Consett.—New St. Patrick's RC church and presbytery, Victoria-rd., Consett. A: A. Rossi (A), 15, Melbourne-st., Consett. *John Cummings, Matamba-terr., Sunderland.

Doncaster.—Six blocks of three-storey flats at Wheatley Park estate for BC. *Unity Structures, Ltd., London, £154,980.

Durham.—12 houses at Donnini-pl. for the CC. City E: L. E. Ellis. *Bell & Ridley, Ltd., 79, North-rd., Durham, £18,667 13s. 4d.

Enfield.—New Manor Farm prim. sch., for CC: *A. Scott & Sons (London), Ltd., £56,962 (subject to MoE approval).

Fareham.—Erection of 16 houses at Fareham Park for UDC. E&S: K. E. Trask, AMICE, AMIMunE, AMIWE. QS: Crump & Ptnrs., Osborne-rd., Fareham. *P. M. Stamp, Mill-st., Titchfield, £24,179.

Lancs.—Following for EC:—New Rawtenstall Lomas-la. jun. and infants' sch. *H. Trickett & Sons, Ltd., Crawshawbooth, £48,621. —New Mossley Micklehurst prim. sch. *H. Hague, Ltd., Ashton-under-Lyne, £32,621.—Phase II of extensions at Stretford tech. college. *Smith & Allcock, Ltd., Chester-rd., Manchester, £43,450.

¶London (Air Ministry).—New works contracts to value of £500 or over for week ended August 9:—

Building work: Gibraltar, Whatlings, Ltd., 10, Woodside-cres., Glasgow, C3. *Artificers' work:* Alconbury, Hunts, and Shepherds-gr., Suffolk, Haymills (Contractors), Ltd. (two contracts). Hanger Green, Western-ave., W5. *Resurfacing work:* Isle of Lewis, Hebrides, William Tawse, Ltd., Angusfield, Aberdeen.

London (British Railways).—Contracts let by London Midland Region:—Fergus Decoration, Ltd., 9, Hanover-st., W1, for decorations and furnishings, Chief Officers Mess, Euston.—Henry Tattersall, Ltd., Spotland Bridge, Rochdale, for heating, hot water services and ventilation, mechanised foundry, locomotive works, Horwich.—North Thames Gas Board, Vincent-st., Westminster, SW1, for installation of gas radiant panel heating, wagon repair shop, Devons-rd.—Hudders & Paynes, Ltd., Chester-st., Aston, Birmingham, 6, for general repairs to roofs and renewal of covering, locomotive shed, Aston.

¶London (MoW).—Contracts placed for week ended August 3:—*Buckinghamshire*: Wexham-rd., Slough, erection of extension to existing sorting office and telephone exchange, Sir Lindsay Parkinson & Co., Ltd., 6 Lambeth-rd., SE1: Stockenchurch, Radnage, alterations and additions to telephone repeater station, G. Biggs & Sons, Great Kingshill, High Wycombe. *Dunbartonshire*: Post Office Telephone Exchange, Miller-la., Clydebank, extensions and alterations, W. S. Gordon & Co., Ltd., 2, Royal-cres., Glasgow, C3. *Lanarkshire*: National Assistance Board, 631, Paisley-rd., West Ibrox, Glasgow, erection, A. A. Stuart & Sons (Glasgow), Ltd., 2275, London-rd., Carmyle, Glasgow, E2. *London*: Government Offices, Great George-st., SW1, internal decorations, Sykes & Son, Ltd., 8, Essex-st., Strand, WC2; Post Office Savings Bank, Blythe-rd., W14, internal decorations, J. W. Green (Painters), Ltd., 171, Graham-rd., Wimbledon, SW19; Telephone Exchange, Crouch End Hill, N8, internal decorations, Royal Courts of Justice, WC2, internal decorations to Queen's Bench Courts 4 and 9 and Chancery Courts 1

and 2, South London Decorators, Ltd., 9, Streatham High-rd., SW16. *Oxfordshire*: Bicester and district, surveyors' maintenance, B. Jackson, 68, Buckingham-rd., Bicester. *Staffordshire*: No. 4 Police Training College, Mill Meece, internal decorations, A. J. Godwin & Sons, St. Patrick's-st., Stafford. *Warwickshire*: Post Office Factory, Fordrough-la., Birmingham, internal decorations to Block 'A,' A. Pearce & Sons (Building Contractors), Ltd., Victoria-st., Birmingham, 9. *Yorkshire*: Post Office Sorting Office, Valley-rd., Bradford, extensions and alterations, J. Pullan & Sons, Ltd., Marley-terr., Beeston, Leeds; Government Training College, Chamberlain-rd., Hull, internal painting, C. E. Pittaway & Son, 277, Anlaby-rd., Hull; No. 3 Temporary Office Building, Crossgates, Leeds, removing and fixing new windows, etc., J. N. Walker, Ltd., The Green, Horsforth, nr. Leeds.

¶London (War Dept.).—Works contracts placed for week ended August 2:—*Bedfordshire*: Miscellaneous, Holts (Bedford), Ltd., Bedford. *Denbighshire*: Painting, Ian Williams & Co., Ltd., Cardiff. *Hampshire*: Tiling, Davies & Rentowl, Ltd., St. Albans. *Nottinghamshire*: Oil-fired heaters, Wanson Co., Ltd., Borehamwood. *Oxfordshire*: Painting and decorating, Ian Williams & Co., Ltd., Cardiff. *Wiltshire*: Roadwork, Anglo American Asphalt Co., Ltd., Bristol; building, Downing, Rudman & Bent, Ltd., Bulford Camp.

Manchester.—New single-storey office block after demolition of existing premises at Pollard-st. for Distillers Co., Ltd. *Fred Mitchell & Sons, Ltd., City-rd., Manchester.

Morpeth.—Rebuilding of 'Comrades Club,' Bell's Yard. A: Turley & Williamson (A/A). 46, Jesmond-rd., Newcastle-on-Tyne. *R. W. Bell & Co. (Builders), Ltd., Mistletoe-rd., Jesmond, Newcastle-on-Tyne, £23,000.

Plymouth.—Reconstruction of the Guildhall, Phase III. City A: H. J. W. Stirling (A). QS: H. S. Haughton & Ptnrs., Royal-bldg., St. Andrew's Cross, Plymouth. *A. N. Coles (Contractors), Ltd., Sutton-rd., Plymouth, £287,980 (subject to reductions).

Plymouth.—12 flats at Pembroke-st., Devonport. City A: H. J. W. Stirling (A). QS: Norman J. Cole & Ptnrs., A/ARICS, Plymouth. *Hill & Lang (Plymouth), Ltd., 32, Wolsdon-st., Plymouth, £21,690.

Rothbury.—New RC church at High-st. A: E. A. Gunning (A), 18, Eldon-sq., Newcastle-on-Tyne. *W. Brown & Son, Wreigh View, Thropton (work in hand).

Southgate.—18 flats, 14 houses and 10 garages at North Circular-rd., Palmers Green, for BC. Boro' E&S: J. T. W. Peat (F). QS: Young & Brown: *Townsend & Collins, 129, Goat-la., Enfield, £74,303 (subject to MH&LG approval).

Sunderland.—Repair and conversion of 3-16 and 30-39, The Avenue, to provide 72 dwellings for CBC. §R. Matthews & Co. (Sunderland), Ltd., £89,701 (amended tender).

Twickenham.—Extensions to Twickenham, Thames Valley county sch. for Middlesex CC. *W. H. Gaze & Sons, Ltd., £58,954.

Tynemouth.—New fire station for TC. Boro' E: D. M. O'Herlihy, 16, Northumberland-sq., North Shields. QS: Falconar & Prentice, 17a, Northumberland-sq., North Shields. *R. Jordan, Back Queen Alexandra-rd., North Shields.

West Bromwich.—18 flats and common room at Florence-rd. for BC. *H. Edmunds & Sons, Ltd., 70, The Broadway, Dudley, £20,739.

Wigan.—90 dwellings at Marsh Green estate for TC. Direct labour. £120,145.

Wolverhampton.—New laboratory and office block at Barnhurst Sewage Works for BC. *Five Oaks Estates, Ltd., Castlecroft-la., Compton, £10,648.

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